

# MILITARY REVIEW

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The MILITARY REVIEW disseminates modern military thought and current Army doctrine concerning command and staff procedures of the division and higher echelons and provides a forum for articles which stimulate military thinking. Authors, civilian and military alike, are encouraged to submit articles which will assist in the fulfillment of this mission.

## POLICY.

Unless otherwise indicated, the views expressed in the original articles in this magazine are those of the individual authors and not necessarily precisely those of the Department of the Army or the Command and General Staff College. The views expressed in the articles by Brig Gen William F. Train and Lt Col Byron M. Kirkpatrick are in consonance with current instruction at the College.

*Editor.*

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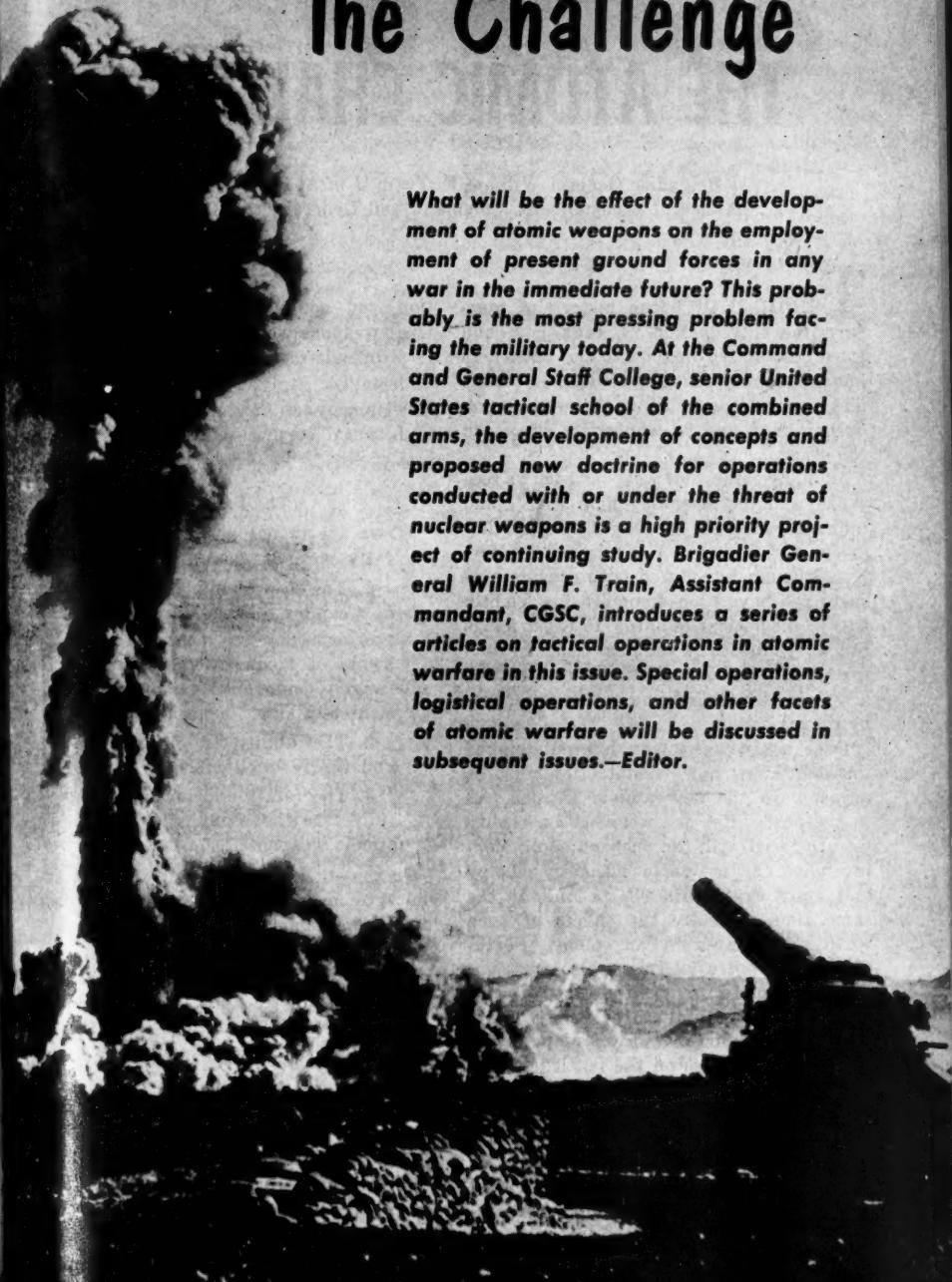
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# The Challenge

What will be the effect of the development of atomic weapons on the employment of present ground forces in any war in the immediate future? This probably is the most pressing problem facing the military today. At the Command and General Staff College, senior United States tactical school of the combined arms, the development of concepts and proposed new doctrine for operations conducted with or under the threat of nuclear weapons is a high priority project of continuing study. Brigadier General William F. Train, Assistant Commandant, CGSC, introduces a series of articles on tactical operations in atomic warfare in this issue. Special operations, logistical operations, and other facets of atomic warfare will be discussed in subsequent issues.—Editor.

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# THE ATOMIC CHALLENGE

Brigadier General William F. Train, *United States Army*  
Assistant Commandant, Command and General Staff College

**T**HROUGHOUT the history of warfare the introduction of each new and more destructive weapon to the battlefield has been accompanied by changes in tactics and organization to utilize the new weapon on one hand and to counter its effects on the other.

In many cases, new weapons such as gas, tanks, and the machinegun in War I and influence-activated sea mines, armor blitzkrieg, and V-1 and V-2 missiles in War II—although introduced with considerable surprise—have been employed inefficiently and in insufficient quantity to exert a significant influence on the final issue. In each instance, time was allowed (unintentionally) for adjustment and countermeasures by the opposition.

Once again technology has outstripped tactical "know how" and tactics must be adjusted to the new atomic weapon. As in the past, after the weapon is a reality we are faced with the problem of developing ways and means to efficiently employ and fully exploit its effects and at the same time minimize the effects of such weapons employed by an enemy. Fortunately, any potential enemy also must undergo a period of development of new tactics. It may be that the relative rate at which the opposing forces adapt to the new destructiveness on the battlefield will decide the issue.

Development of a weapon to which our tactics must be adjusted is a reversed procedure. We should be developing concepts of future war to fit national objectives and determining the requirements in organiza-

tion and equipment before determining what weapons we need to do the job. This is a difficult task, but one which must be undertaken. Only by such thinking and development can new weapons be employed with initial surprise and efficiency on the battlefield.

## The Problem

If we are to use atomic weapons most efficiently, we must have:

1. The desired numbers and yields of weapons and delivery means with the accuracy to meet the requirements of troop safety and with the range to engage targets which can immediately affect our operations.
2. The ability to obtain accurate and timely intelligence.
3. The forces and tactics to exploit fully the advantages produced by atomic weapon effects.

On the other hand, to neutralize the advantages accruing to the enemy through his use of atomic weapons we must:

1. Reduce the enemy's atomic capability as far as possible by destroying his weapon stockpile, delivery means, and industrial facilities.
2. Deprive the enemy of information on our forces.
3. Devise procedures and tactics to minimize the effects of any weapons delivered against our forces.

Current United States written doctrine for atomic warfare, emphasizing dispersion

and mobility, affords an increasing amount of knowledge and inspiration in meeting these requirements. We must be unceasing in our efforts to approach the solution while recognizing that the experience of battle will more fully develop the true picture.

*No one can say whether atomics actually will be used in any future war, but unquestionably the threat of atomics will remain and this threat will exert a significant effect on organization and tactics. Because the initiative in determining whether atomic weapons will be used at the start of a future war may well rest with the enemy, we cannot afford the luxury of one type unit to fight an atomic war and another to fight under nonatomic conditions. Our tactics, organization, and equipment must be adaptable to either.*

#### Imaginative Flexibility

While this discussion will be devoted primarily to tactics, I must emphasize that inspired, courageous leadership of men on the battlefield is a continuing essential of military success.

The mental attitude of the commander is particularly important in atomic age warfare.

The full impact and extent of changes resulting from the employment of atomic weapons is becoming clearer at this time. Therefore, it is of utmost importance that every situation, both offensive and defensive, be evaluated carefully in light of the

*If we accept atomic weapons as the greatest challenge in centuries of military operations, we can make this force the basis for the preservation of peace, or for victory in any possible war of the future*

increased capabilities resulting from the availability of atomic weapons as well as the limitations imposed on our forces by the atomic capability of the enemy.

*Great flexibility of thought, as well as action, is essential to the success of operations on the atomic battlefield where the*

*offensive spirit must be retained in all situations, both offensive and defensive.*

There is an inherent requirement for a bold approach to the employment and exploitation of atomic weapons, and in reacting to the enemy's employment of such weapons. This boldness is not to be confused with rashness which stems from incomplete estimates, poorly thought-out decisions and hasty, ill-considered actions. Rather it has its roots in complete planning, followed by violent, aggressive execution, with maximum power of all means, both atomic and otherwise, rapidly brought to bear at the decisive point and time.

Lacking the bold approach, the commander or staff officer will fail to utilize fully the powerful effects of atomic weapons and will endanger the success of his unit's mission. Further, failure to foresee and plan for immediate reaction to such attack and for the continuation of the mission will subject his unit to the risk of total destruction or defeat in detail.

Flexibility, offensive attitude, and bold approach are reflected in all of our present tactical concepts—offense, defense, and retrograde operations.

#### Retrograde Operations

Although wars may be won only through offensive action, the Army must be prepared to fight delaying and defensive operations in order to later assume the victory-winning offensive.

Current concepts of retrograde movements are not materially changed. The object remains to gain the maximum time and inflict the greatest number of casualties on the enemy while giving up the least possible space at the expense of the fewest lives. In the hands of a bold, imag-

inative commander, however, techniques may change radically. For example, should a delaying force become closely engaged, the use of atomic weapons may permit the commander to retain his position and destroy or slow the enemy attack materially, permitting an orderly night withdrawal. On the other hand, the shock effect of atomic weapons may be used to assist in disengaging, thereby permitting a daylight withdrawal. Atomic demolitions may seriously hamper enemy forward progress if used in defiles in conjunction with delaying forces.

The difficulties inherent in retrograde operations will be increased when the enemy also uses atomic weapons. The daylight withdrawal from action, even when the defender has control of the air, may become so costly that the defender must hold at all costs in one position until conditions of poor visibility or darkness exist. The danger will always exist that some delaying forces may be isolated and destroyed by enemy atomic operations.

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### The Defensive

The threat of an atomic attack places additional emphasis on dispersion, passive defensive measures, employment of mobile reserves, and active security measures.

The question of dispersion in defensive operations is controversial. It is apparent that dispersion, both laterally and in depth, to include administrative as well as tactical echelons, will be necessary. The difficulty lies in determining the degree.

An infantry battalion or a combat force of similar size is considered to be the basic fighting unit. Such a unit may or may not be a lucrative atomic target depending on the situation. Dispersion within the battalion will be limited by the requirement for mutual fire support to retain its effectiveness as a unit. However, maximum practicable dispersion between units within regiments, combat commands, divisions, or corps is essential to avoid presenting profitable targets. The dispersion effected within these larger units must not be so great as to jeopardize the accomplishment of the assigned mission.

The degree of dispersion will depend on the mission to be accomplished and the situation, to include the enemy's atomic capability, the terrain, individual protection afforded the troops, and other factors.

Dispersion alone is not a cure-all for minimizing atomic casualties. It must be coupled with unit discipline and observance of standing operating procedures designed to reduce the vulnerability of individuals, units, and installations.

Atomic warfare requires some major changes in the several forms of defense.

### Defense Operations

In the defense of a position or line the commander concentrates his attention and resources in one area. He places principal reliance upon the troops in the battle position and upon all available firepower to hold key terrain. If a penetration of the

battle position is made, the reserves assist either by counterattack or by occupying positions that block the advance of the attacking enemy.

This type of defense takes either of two general forms—the "ideal" or the "extended." Ideal position defense is characterized by effective mutual fire support, and by strong reserves to deepen the defense and to conduct counterattacks. The enemy must mass his forces to achieve any reasonable expectation of success in carrying these positions, and thereby he presents a profitable target for atomic weapons. Unfortunately, such a defense also provides a profitable target for enemy atomic weapons, and allows limited space for maneuver of the reserves and for employment of atomic weapons against the enemy within the battle position.

*In an atomic war this form of defense would be employed only when essential to hold a terrain feature or an objective at all cost. The infantry division, as presently organized, is well-suited to conduct the ideal form of position defense.*

In the "extended" position defense the defensive resources are more widespread. The defender, realizing that he may have to give ground, attempts to canalize the attacker into noncritical areas by organizing critical terrain features for all-around defense. He ejects or destroys the enemy and restores the position by employing concentrated firepower, atomic and nonatomic, in conjunction with vigorous counterattacks. The counterattack, with or without atomic fire support, is the decisive element of the defense.

The extended form is more flexible than the ideal. Wide intervals are created between defensive positions, but the organization within the battalion defense position must provide for mutual support between units therein. Depth provides maneuver room for the mobile reserves. In the conduct of this defense atomic fire support

will be employed forward of or within the battle position. The atomic fires will be exploited by the striking force to complete the destruction of the enemy.

Three requirements are immediately apparent:

1. A means to provide surveillance over the gaps between strong points.
2. A strong mobile striking force.
3. Reliable communications and control.

The present United States infantry division can meet most of these requirements to a degree. However, to meet them fully more reconnaissance elements and surveillance means are needed, and additional trucks and tanks are necessary to provide the required mobility. There will be a greater reliance on radio at all echelons to obtain the required control upon which success depends.

Present thinking visualizes the extended form of the position defense as the solution to many defensive missions under atomic conditions. While this defense is strong enough to force the enemy to mass and thereby present targets for atomic attack, at the same time the divisional units are not considered excessively vulnerable to enemy atomic attack.

#### Mobile Defense

The second major type of defense is the mobile defense in which all defensive resources depend on a high degree of mobility. Emphasis is placed on the use of mobile combat power—armor insofar as resources permit.

Extreme flexibility and "rolling with the punch," requiring space in depth, keynote the mobile defense.

The forward defensive positions, occupied by minimum forces, consist of a series of dispersed strong points, observation posts, and, where appropriate, islands of resistance to detect, delay, disrupt, and canalize the enemy into areas of the de-

fender's choice. This highly flexible defense plan is primarily based upon the use of a powerful striking force ready to meet rapidly changing situations and unexpected developments so common in battle. The defender retains a good deal of initiative and the success of his defense depends upon his skill in attacking the enemy with the mobile striking force, with or without atomic weapons support, either in front of, within, or behind the forward defensive screen, when and where the defender has the greatest advantage.

Atomic fire support will be employed to disrupt and slow enemy penetrations, destroy the forces within the penetration, disrupt reinforcements, support the counterattack, or in conjunction with limited objective attacks in front of the forward defensive screen.

The same three requirements cited in the extended form of the position defense exist:

1. A means of surveillance within the gaps on the forward position.
2. A highly mobile reserve.
3. Reliable communications and control.

An infantry division, augmented with additional reconnaissance units, tanks, and transportation, may be employed effectively in a mobile defense when conditions warrant; however, the organization and equipment of an armored division make it particularly adaptable to this form.

On a large continental land mass such as Europe or North Africa, there very likely will be insufficient allied forces to adopt anything that approaches the concept of the ideal form of the position defense of a predetermined position even if it were not for the extreme vulnerability of this form. As a consequence, we must think in terms of flexibly minded commanders, dispersed formations, and great reliance on mobile general reserves as counterattacking forces.

In summary of defensive operations it

appears that three characteristics must be provided:

1. Mobility.
2. Dispersion without overextension.
3. Exploitation of own atomic capability.

### The Offense

The current concept of the offense is characterized by penetrations deep into the enemy rear by mobile ground forces with sustained combat power, including atomic support. Upon gaining this favorable position, they speedily destroy enemy forces, enemy reserves, communications, supplies, and other forms of support. The attacker maneuvering his flexible forces to the critical areas enjoys a superiority difficult to overcome. The defender is restricted to countermoves and, therefore, is one move behind the attacker. In this manner numerically inferior forces may attain the capability of defeating numerically superior forces. These are essentially the German tactics in their campaigns in the west and initially in western Russia.

It is evident that to carry out such operations, World War II techniques of offensive warfare will require modification to attain:

1. Greater dispersion to minimize effects of enemy atomic employment, consistent with intelligence capabilities and ability to accomplish the mission.
2. Increased mobility and rapid exploitation of atomic effects.
3. Improved communications and other control measures required by greater dispersion and the timing and speed of operations under atomic conditions.
4. More flexibility to take advantage of the bonus effect of atomic weapons and resulting unforeseen opportunities and to compensate for our own mass casualties resulting from enemy atomic attacks.

### Offensive Risks

The offensive forces accept certain risks which become of acute importance to the defender in atomic warfare. Because he must move in the open, the vulnerability of the attacker to atomic weapons is increased. The attacker's concentration is usually revealed to the defender once the attack is launched. The attacker must, at some decisive point and time, mass sufficient means and forces to overcome and pass through any well-organized defense. This emphasizes one of the primary problems in atomic war—the requirement to present a worthwhile atomic target to the enemy for a minimum period while achieving the "mass" necessary to accomplish the mission.

The principal of "mass" often has been associated only with numbers of combat troops. Actually, it implies the concentration of men, firepower, and equipment at the point of decision. *Atomic weapons can of themselves create the effect of mass in a period of seconds or minutes.* To achieve the same effect of mass without atomic weapons might require the concentration of major forces over periods of hours, days, or even weeks. Thus it is evident that because of the great amount of firepower provided by atomic weapons we can achieve an economy of force. It also follows, then, that a greater degree of security from enemy atomic attack will be attained in that more space is available for dispersion and movement of the required forces.

### Fire and Movement

The planning and execution of offensive operations continue to be based upon the proper integration of firepower and maneuver. The tactical atomic weapon has greatly enhanced the flexibility of this combination, for in one situation atomic attack may be considered as supporting the scheme of maneuver, while in another situation the maneuver plan may be tailored to fit the planned employment of atomic weapons. For this reason, in plan-

ning, the employment of atomic weapons and the scheme of maneuver are coequal in importance and should be considered concurrently.

*This increased firepower will, in all probability, result in adoption of courses of action and forms of maneuver which would be infeasible without atomic weapons support. For example, heretofore we have generally preferred the envelopment to the penetration. Now, in a matter of seconds atomic weapons effects can create a situation which makes the penetration a desirable and often preferable scheme of maneuver.*

The current offensive concept envisages operations of dispersed forces on wide fronts and at great depths on a fluid battlefield, increasing the requirement for close control throughout the operations. Close control, of course, demands rapid and sure signal communications with all elements, and, because of the mobile nature of these operations, an increased reliance upon radio. Close control implies close attention of higher echelons of command to the location and plans of subordinate echelons.

*The greatest tactical results from the employment of atomic weapons come from ground exploitation of the effects, rather than from the effects themselves.*

Therefore, exploitation of atomic effects by highly mobile forces of all arms is emphasized. Normally, the size of the exploiting force should be geared to the scale of the atomic attack. The superiority attainable through the use of the atomic weapon should be anticipated. When fully exploited it produces more decisive results in a shorter period of time than has been possible in the past. In executing a successful penetration, employment of atomic weapons on targets developed in the pursuit will permit even greater exploitation results.

Consider an example of the use of atomics in a penetration. Concentrations

of forces still will be required. However, such massing will be held to a minimum and when required will take place on a deep front in multiple columns to follow up and take advantage of the tremendous effect of atomic explosions.

The required mass of forces for the attack will be achieved by the rapid movement of units from relatively dispersed assembly areas on a schedule devised so that the assault elements arrive in attack positions at the last possible moment prior to the atomic preparation. These forces launch the attack as soon as possible after the atomic preparation and then redisperse as rapidly as the situation permits. Provided the operations are conducted with speed by a flexibly minded commander the redispersed forces should not present an atomic target to the enemy.

Organizationally speaking, the type of unit required for such fluid operations must be capable of rapid cross-country mobility; it must possess operational and tactical speed coupled with firepower and shock action; and it must have communications which will permit close control in dispersed operations requiring close timing.

To meet these requirements of fluid warfare an infantry division must be augmented to give it the necessary additional firepower and mobility. The armored division is well-suited to the task.

#### Logistical Problems

Problems of logistics, particularly in the communications zone, are substantially the same under each of the three types of tactical operations. In the field of supply there must be dispersion and duplication of installations. This can be accomplished with either small general depots or branch depots, but until transportation means are greatly improved, higher supply levels in the theaters will be required. In anticipation of higher casualties, requirements for medical personnel and facilities will be in-

creased and quite probably lower evacuation policies will be in effect.

It will be unwise to think in terms of a few major ports; all ports and many beaches must be developed to reduce the impact of the total loss of any of them. Likewise, all inland means of transportation must be developed to an extent not contemplated in World War II or Korea, and air will carry a significant portion of the tonnages. These and other requirements will greatly increase our need for service personnel, always at a premium. The answer seems to lie in greater use of local civilian personnel, more efficient equipment, and better management.

#### Air Mobility

We must not overlook the use of air in achieving essential mobility. Battlefield mobility is a key factor in operations in which atomic weapons are used or their use is anticipated. Although organizational changes under consideration may increase mobility to some extent, the speed with which combat forces can move on the ground remains substantially the same as in World War II. It appears that for some time to come the rate of movement of a ground unit can be increased appreciably only by the use of aircraft. Whereas armor and infantry may accomplish the rapid exploitation of an atomic attack in relatively close-in actions against enemy frontline units, deeper penetrations can be accomplished only through movement by air.

At the present time, the Army's air mobility is largely dependent upon both United States Air Force and Army aviation. Army aviation has an ever-increasing capability for the air movement of Army forces for sizable unilateral airborne operations.

Joint airborne operations conducted by standard airborne divisions of the United States Army have the inherent capability of being readily adaptable for either atomic or nonatomic warfare. Flexibility, surprise,

speed of execution, and rapid concentration as well as rapid deconcentration are the trademarks of airborne warfare. They will assist in providing the decisive force that is so essential for the atomic battlefield of today.

Looking at the other side of the ledger, it is apparent that airheads in enemy territory could be vulnerable to atomic attack, particularly in the early stages of development when the forces within the perimeter lack mobility for rapid dispersion and concentration. To minimize this vulnerability, our forces must establish local control of the air and, at the same time, reduce the enemy's atomic capability to an acceptable level of risk.

An important consideration is that, although the standard airborne division has been designed so as to be air transportable by medium aircraft, except for its tank units, there are certain items of equipment such as self-propelled AA weapons and items of heavy maintenance and engineer equipment that can be air transported only in heavy aircraft. To reduce this limitation of our airborne mobility further a light airborne division (the 101st) which can be moved as an entity by present-day Air Force troop carrier aircraft, is currently organized and undergoing evaluation.

A large requirement exists for personnel and equipment to construct and maintain long runways used in our airborne operations. We are constantly striving to reduce this airfield requirement through the development and procurement of a true assault aircraft that fits the Army's needs for takeoffs and landings with large payloads on small unprepared fields.

#### Army Aviation

As noted before, a second source of air mobility is Army transport aviation, now in its development stage. Available aircraft are not completely adequate in quantity and quality at this time, but the

prospects of obtaining more and better aircraft are brighter than in the past and the possibilities of their tactical and logistical use have opened vast fields of investigation.

Doctrine as to the employment of Army aviation is neither complete nor fully tested. It has become clear, however, that some means to obtain battlefield mobility by air is required by the Army. *Frequent small-scale movements of men and matériel in the combat area must be commanded and controlled by the individual responsible for the success of each particular operation.*

It also has become apparent that aircraft must be used to supplement, if not supplant, vehicles in logistical support of operations in atomic combat. Air lines of communications, by their very nature, are less susceptible to atomic weapons effects than ground lines. Added speed in moving supplies will increase over-all battlefield mobility.

At present the United States Command and General Staff College teaches the use of Army helicopters in air-landed assault and supply in the penetration, in the exploitation, in river crossings, in amphibious operations, and in coordination with joint airborne operations. This instruction is based on current capabilities of helicopter units, but the possibilities of fixed-wing assault aircraft are not being overlooked. Aircraft now under development will provide additional mobility to the future army in the field.

#### The More Distant Future

Up to this point only a concept of operations which is specifically applicable to a war in the immediate future has been considered.

There are certain considerations more specifically applicable to warfare in the more distant future, some five to 10 years from now.

Those concerned with the development

of doctrine for future warfare find many contradictions, some of which must be solved temporarily by assumptions. A few of these contradictions indicating the complexity of a view of the future atomic or nonatomic war are: limitations on dispersion and risks inherent in mass; reliance on radio for control in the face of electronic countermeasures; movement capability of units which have been "dug in"; doctrine versus unproved concepts; and the possibility of atomic weapons replacing ground forces.

Undoubtedly, the dominating weapons of the future, whether they actually are used, are the atomic and thermonuclear weapons. It is true that in the light of the realities of the world situation today, it is highly possible that sizable actions may be fought without recourse to atomic weapons. Therefore, we must be prepared to fight and win with or without the use of such weapons. *It is obvious that massing of enemy ground troops under conditions involving the least likelihood of use of atomic weapons must be countered by the calculated risk of similar more or less temporary massing of our ground forces to avoid nonatomic defeat. However, tactics and dispositions for the earliest possible return to active atomic conditions must be constantly in mind and capable of instant implementation.*

The farther forward in the combat zone the less difficult this transition will be. Since logistical systems and installations would be most difficult to change from one set of conditions to another or to develop on short notice, it is evident that these must remain pretty well geared to active atomic conditions, accepting the basic duplications which may result and trying to minimize them by timely expedients.

We will be best off in the future if our research and combat developments can concentrate on equipment, tactics, and organization which will call for the least amount of change to assure the greatest

effectiveness of our forces under either condition.

The second basic point is the matter of the effect of unexpected quantities and yields of atomic weapons. Here, as we progress further into the future, the door is wide open for assumptions.

A line of thinking briefly summarized as "one bomb, one battalion" has grown up from the early period of atomic scarcity due largely to the fact that the diameter of effect of our well-known nominal or Nagasaki type bomb corresponded roughly to the area of a dispersed battalion.

Where does this past approach lead in an era of unlimited numbers and yields?

#### Mission Is Paramount

Examination of this problem rapidly leads away from any relationship of unit size to bomb size, and back to the consideration of the maximum amount of dispersion which can be achieved and yet leave the unit in a condition to cope with the threat of massed enemy ground forces. *It is of no use to have a unit reasonably protected from a nuclear weapon if a small, resolute enemy ground unit can annihilate it with conventional means.* Even if only atomic weapons are considered, any doctrine which would require tactics or organization to shift in accord with changing estimates of numbers and yields of enemy atomic weapons capabilities would lead into the easiest kind of a trap for the enemy to close by using a deceptive pattern of yields. It is impossible to avoid returning to that first principle of war—the objective. *As long as it is possible or necessary for ground forces to occupy a given theater their disposition must be fitted to the accomplishment of the mission.*

No intelligent and systematic strategic concept, tactical organization and doctrine, and integrated weapons system can be devised which will enable ground, naval, or air forces, singly or in concert, to meet all requirements of a situation in

which both sides have and employ virtually unlimited nuclear weapons and delivery systems. This would be a worldwide, unlimited atomic holocaust of mutual annihilation. It is probable that in any atomic war limited supply, mutual restraint, political and moral influences, or attrition of readily available atomic weapons and delivery means, or a combination of these limiting factors, soon will develop a situation in which both sides (or at least one side) have lost the capability of using atomic weapons at will and must make highly selective and infrequent use of them. It is for this situation that the *basic* organization and tactics of armed forces should be tailored.

Similarly, the operation of present logistical systems would be impossible under conditions of unlimited atomic availability. For example, no matter how many ports and beaches were functioning it would never be possible to keep enough in operation to support large armed forces. Land lines of transportation and depots and other logistical installations on today's scale also could not exist. Some new logistical concept clearly is a priority requirement.

A third conclusion can be drawn concerning the limiting factors governing dispersion.

#### Dispersion

There definitely will be a high degree of dispersion, probably between rather than within battalions. But what are some of the implications of this dispersion as it applies to the more distant future? First, there is sufficient experience to indicate that ground tactics based on habitually surrounded battalions of any type are going to result in the loss of more battalions than we can afford. Hence the security of these separate battalions must be integrated by at least screening the areas between them. In fact, *control over these intervening areas appears to be the vital factor in determining the over-all success*

*of any operation.* Control may, of course, be provided in different ways, depending upon needs. There may be single or double screens, far out and close in; patrol bases; patrols; artillery or other fire support; and observation by visual means, radar, or other devices.

This matter of observation, particularly if scientific developments permit it to be worked out on an all-weather basis, can well be the determining factor in both the amount of dispersion possible between units and the echelon at which such dispersion can be effected. For example, when scientific methods of observation are such that sufficient positive warning can be obtained, it may be possible to separate companies as far as we now visualize battalions.

Admittedly, we are considering control in a very broad sense—the ability to spot the enemy and react in time to his presence by fire or movement, or both. Under many circumstances this loose degree of control would not suffice and a greater degree would be required, such as that afforded by interlocking fires from separate strong points, or actual patrols, patrol bases, or screens as indicated before. Furthermore, we are considering not only the security of the close combat units but of the many independent units, such as artillery, which must work up close to the frontlines if the close combat units are to receive the essential degree of support, and yet which cannot advantageously function in the confines of a battalion perimeter. Such units must be either protected or given sufficient warning to permit them to roll with a punch. It must also be remembered that such units cannot function effectively if they are continuously on the move or continuously fighting off direct enemy attack.

For the future a great effort must be made to integrate doctrine, tactics, material, and organization for atomic and for nonatomic conditions so that there will be the least possible difficulty in transition

between the two. Dispersion under any condition must be the maximum that will still permit accomplishment of the mission. In particular, deployment must be such that areas between separated units are not penetrated without the knowledge of the appropriate commander and, consequently, without the opportunity for positive decision in advance as to his actions. These actions include planning the necessary counterattacks to destroy the enemy force and withdrawing those elements which, under dispersed formations, might be needlessly cut off even before they are engaged.

#### The Challenge

In summary, concepts for atomic warfare are, just as in the past, aimed at the objective—the destruction of the enemy forces. There may be only slight differences in offensive and defensive tactics; each must rely on dispersion, mobility, and flexibility. The offense will be charac-

terized by rapid exploitation of atomic effects to seize deep objectives on wide fronts. Defense will be resilient instead of tied to a position. Integrity may have to be maintained by "rolling with the punch," rather than by holding a line.

Finally, we are not complacent, but are continually seeking a better solution. It is incumbent upon us all to assist in developing tactics and organization which will make the best use of the capabilities of the tactical atomic weapon.

*If we believe the advent of nuclear weapons presents an insurmountable problem to the strategist, tactician, and logistician, we have begun to lose the flexibility and imagination without which we are doomed to defeat. If we accept this technological advancement as the greatest challenge in centuries of military operations, we can make this force the basis for the preservation of peace—or for victory in war if the need arises.*

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Those of us who are concerned with planning for national security are asked to deal with many imponderables and question marks. The toughest question revolves around the uncertainty as to the form which a future war may take. Will it be long or short? Will atomic weapons be used without restraint? If so, what will result from this release of atomic energy with a destructive power so great that its result is beyond our imagination?

\* \* \* \* \*

The Army has set for itself the task of readiness for any kind of war. The Army is equipped and trained to apply military power with discretion, to discriminate between friend and foe, and to temper its application of force to fit the degree and scope of aggression. Military planning must adjust itself to the increasing reluctance of peace-loving people to embark on general atomic war and recognize the need for increased attention to the constant danger of erosive efforts against militarily weak members of the free-nation community. Such aggressive efforts must be deterred or defeated promptly—otherwise they may bring on the big war which nobody can truly win.

*General Maxwell D. Taylor*

# Command Aspects in the Tactical Employment of Atomic Weapons

Lieutenant Colonel Byron M. Kirkpatrick, *Corps of Engineers*  
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"CORPS will breach the enemy main defensive zone initially by employing atomic weapons in mass against forward positions and enemy reserves. The rupture of the enemy defenses will be completed by armor attacking immediately after the atomic explosions.

"To maintain the momentum of the attack, atomic weapons will be employed against the second defensive zone.

"The enemy appears to be very strong and well-dispersed with large reserves in depth. I desire a high assurance that we will achieve sufficient superiority in the area of the penetration to ensure an immediate rupture of his main defensive zone in front of our main attack and, at the same time, hit his reserves heavily. Yet I want a 99 percent assurance of no casualties to our own forces.

"Further, I desire that there be no significant residual contamination in areas through which we plan to maneuver.

"I also desire that some weapons be held available for targets of opportunity."

Thus might a corps commander issue his command guidance and set the stage for his staff to plan an operation involving the use of atomic weapons. The commander based his planning guidance on his assigned mission and information available to him at the time.

*The tremendous increase in the Army's tactical means represented by atomic weapons demands that the future commander plan his maneuver and employment of these weapons concurrently, carefully, and in detail*

Department of the Army doctrine, as expressed in Field Manual 100-31, *Tactical Use of Atomic Weapons*, states that the introduction of atomic weapons to the battlefield will cause certain modifications in organization, tactics, and techniques but that the principles of war are not changed by the advent of atomic weapons. These weapons are not all-powerful but must be considered as another tremendous increase in the power of the Army's weapons family, and must be integrated with other weapons when they are used tactically. Because of their power, the commander must plan their employment carefully.

## Target Selection

Factors the commander will consider in selecting targets for atomic weapons include:

1. His mission and the importance of the target.
2. Availability of atomic weapons.
3. Location of the target (as affected by atomic delivery capabilities and the safety of friendly troops).
4. The nature of the target.
5. The predicted condition of the target area after the burst.

Some of these factors are tactical, some are technical, and some are both. When

only a limited number of weapons are available, the tactical considerations are paramount, hence the target first must be evaluated in terms of the tactical situation. "What is the importance of this target in the light of my mission?" the commander asks; "Can this target affect the accomplishment of my mission?" If it can, then the technical factors must be considered to determine its suitability for attack within the availability of weapons and delivery means.

The commander generally will be able personally to evaluate a target in terms of the mission, nature of the target, and the availability of atomic weapons. However, evaluation in terms of delivery capabilities, troop safety, and predicted condition of target area normally requires a technical analysis by his staff.

The employment of atomic weapons in tactical operations requires special command attention. In tactical planning, because of the changes in the enemy situation which may be brought about rapidly by the effects of the weapon, the employment of atomic weapons and the scheme of maneuver must be considered concurrently. Hence the old teaching that firepower must support the scheme of maneuver may, in some situations, be set aside; rather, the scheme of maneuver may be adjusted to exploit the weapon's effects or avoid the results of its devastation. Further, the magnitude of the weapon's effects requires special command considerations for the safety of friendly forces.

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Therefore, in his estimates and plans, the commander should give the same consideration to the employment of atomic weapons as he would to the employment of major units. The question may be asked: "With the advent of tactical atomic weapons, what are the considerations upon which the commander must take positive action?" With regard to the employment of atomic weapons his responsibilities include:

1. Formulating and promulgating policies, directives, and standing operating procedures containing information and guidance for subordinate units relative to the use of, and defense against, atomic weapons.
2. Submitting to the next higher echelon his recommendations for the allocation of atomic weapons for the support of his forces.
3. Ensuring that adequate, fully mobile forces are available to exploit the situations created by the atomic weapons when exploitation is feasible.
4. Indicating the objective of the atomic attack. Clearly defined objectives are essential to provide direction and guidance for staff planning and subordinate commands.
5. Providing for troop safety.
6. Providing for custody, security, and movement control of atomic weapons or their component parts in the area under his control. Delivery units—gun, guided missile, and free rocket—do not have sufficient organic means to provide for their own security. The commander having area responsibility is responsible for custody, surveillance, security movement control, and the provision of escort when atomic weapons, or their component parts, are moved in or located in his area.

#### Planning Sequence

Let us return to our imaginary situation. The corps commander has given his guidance to his staff and staff planning for

the employment of atomic weapons is underway. The following is a logical sequence of events involving the actions of the commander and the staff in planning for an operation using atomic weapons.

#### *Prior Planning*

Although listed at the head of the planning sequence, prior planning is a continuing process. Even before receiving a mission, the staff, principally the G2 and G3, is studying the enemy situation to determine likely targets. The area of consideration must include not only the current zone or sector of operations, but projected zones or sectors as well. The study of enemy units should include enemy units in adjacent sectors, or more distant, which may influence the accomplishment of the mission. This constant review serves three purposes: it reveals targets of opportunity; it indicates gaps in information and provides G2 with a basis for intelligence planning; and it provides a basis for requesting an allocation or an increase in allocation of atomic weapons when a mission is assigned. Finding suitable targets has always been a difficult task and, in an atomic situation, finding suitable targets on which to expend these weapons will be more difficult. The targets are there. The real difficulty lies in locating them and assembling the necessary elements of information concerning them to permit a decision in time to engage the targets with atomic weapons. Consideration of the mission, information currently available on the enemy, a detailed study of the terrain, and a knowledge of the enemy's tactical doctrine and order of battle are tools with which the staff must work in the selection of suitable atomic targets.

#### *Initial Planning*

This phase begins with the commander's initiative or the assignment of a mission by his higher headquarters. Included in this phase are the commander's planning guidance, the preliminary planning confer-

ence, the detailed target analysis, and presentation of staff estimates to the commander.

#### *Planning Guidance*

The first of these, the commander's guidance, is illustrated at the beginning of this article. Other examples of guidance are equally appropriate and, depending upon the personalities of the commanders concerned, may take various forms and may be expressed in varying degrees of detail. The purpose of the commander's guidance is to facilitate the work of the staff, to direct staff effort along the shortest course to meet the commander's intent with respect to the way he wants atomic weapons to be used in the operation being planned. The cited example of command guidance is fairly detailed. Other commanders may express guidance in more general terms; for example: "The enemy appears to be very strong and well-organized, with large reserves disposed in depth. We must plan for a high degree of assurance to hit both his organized position and his reserves heavily with atomic weapons, striving to achieve surprise. At the same time, I want a high degree of assurance that we do not expose our own forces to casualty producing effects."

How should the commander express planning guidance? There is no specific answer to this question. The guidance will vary with the background and experience of the commander in the employment of atomic weapons, the amount of supervision he wishes to exercise in the matter, and his confidence in his staff. A great deal will depend upon the mutual understanding of the commander and the staff. Guidance will be as detailed as the commander sees fit.

Whatever the degree of detail it contains, the commander's guidance should include, as a minimum, the damage desired to the target and *troop safety*. Other items appropriate for inclusion are: a broad statement of the *general plan of use of*

atomic weapons, *assurance of damage*, and *contingent requirements*. In analyzing the example of command guidance which opened this article, the *general plan* was expressed in the first two paragraphs. The *assurance and damage desired* were expressed by the commander in his statement: "I want a high assurance that we will achieve sufficient superiority in the area of the penetration to ensure an immediate rupture of his main defensive zone in front of our main attack and, at the same time, hit his reserves heavily." The *contingent requirements*, in this case, were expressed by his statements that he desired that there be no significant residual contamination in areas through which his troops planned to maneuver and that he desired that some weapons be held available for targets of opportunity. *Troop safety*—"I want a 99 percent assurance of no casualties to our own forces"—completes the essential elements of the guidance.

With this guidance the staff can begin specific plans for the forthcoming attack. The target analyst, a staff officer specially trained in the technical methods of determining atomic weapon requirements based on desired results from these weapons, makes an initial analysis of each target proposed by the staff or subordinate commanders to provide G3 with the attack capabilities of available atomic weapons for discussion at the initial planning conference. The commander's guidance is interpreted and amplified by the G3 to the extent necessary to provide the target analyst the specific criteria he requires to enter his charts, graphs, and templates, and develop a recommendation for the weapon, delivery means, location of bursts, and troop safety measures required. The "high assurance" of "heavy damage" or "sufficient superiority" is translated by the G3 in terms of, for example, 90 percent assurance of at least 40 percent casualties to the enemy forces.

### Planning Conference

The purpose of the *preliminary planning conference* is to determine ways and means to carry out the commander's general plan. Feasible schemes of maneuver and atomic targets are discussed. Although conducted principally for the chief of staff (or commander) by the G3 and G2, all interested members of the general and special staff attend, as well as liaison personnel from supporting units and other services with atomic weapons delivery capabilities or interests. Commanders of major subordinate units or their representatives attend and present their recommendations on targets to be attacked, priorities for targets, and restrictions on fires. In this conference atomic targets are discussed, including those recommended by subordinate units. Those atomic targets which are not eliminated, based on the estimated effects of atomic bursts or availability of atomic weapons, are carried forward for more detailed target analysis. Eliminated targets may be noted for attack by nonatomic rather than atomic weapons.

Current doctrine specifies that G3 has general staff responsibility for *detailed target analysis*. (However, doctrinal changes under consideration indicate that the fire support coordinator may be charged with this responsibility.) The G3 can utilize such special staff sections or agencies as he deems appropriate for details of preparation of the analysis. G2 provides target intelligence. The purpose of the detailed target analysis is to determine if an atomic weapon, or weapons, can accomplish the desired results. If so, the analyses result in specific recommendations for the employment of atomic weapons in the operation being planned.

In the *presentation of staff estimates to the commander* each staff section includes recommendations pertaining to its field, as appropriate, made necessary by the employment of atomic weapons. This staff

conference becomes the *final planning conference*.

### Decision and Concept

The commander's estimate, decision, and concept of the operation follow the receipt by the commander of the estimates and recommendations of his staff. When the commander announces his decision and states his concept of the operation, the staff can culminate its planning in the preparation and publishing of the operation order or plan.

The commander's decision includes who performs the operation, what the command will do, when the operation will begin, where the main attack will be made, how the commander expects to employ his major tactical groupings, and sufficient of the why to enable the subordinate commanders to carry out the operation intelligently and efficiently. It also includes the commander's decision as to employment of atomic weapons. The details as to how these weapons will be employed are included in the concept of the operation.

The commander's concept of the operation includes his general plan of atomic weapons employment. The purpose of this concept is to amplify adequately the decision to ensure complete understanding of how the commander visualizes the operation will be conducted. As a minimum, the commander should include for each atomic target: time on target, height(s) of burst, type(s) and yield(s) of weapons, and desired ground zero. In his instructions he also may specify troop safety criteria and the fraction of damage required and the assurance thereof.

The concept referred to here is the commander's announced concept and not the final concept contained in the written operation plan or order. The announced concept normally will include many items which may be included in other portions of the order rather than the paragraph set aside for the written concept. Examples

of these items are the detailed information on the how of the employment of atomic weapons. This information, although announced by the commander, is included in the atomic fire plan appendix to the fire support plan annex. Another example is the troop safety precautions which properly are included under the co-ordinating instructions portion of the operation order or plan.

With the publishing of the operation order or plan, the commander and his staff are faced with the important task of implementation and supervision of the order when it becomes effective.

### Other Analyses

Important to the employment of atomic weapons is the post-strike damage assessment made following an atomic attack. An immediate post-strike analysis of each target attacked is made by the headquarters employing the weapon or weapons to determine whether or not and to what extent the strikes produced the desired effect in the target area. The extent to which utilized weapons actually produced the desired casualties or damage to the enemy may have considerable impact on the exploiting maneuver or plan of defense. The data required to accomplish this assessment include weapon yield, burst height, and actual ground zero. Followup analysis of burst areas, conducted by theater teams, also aids materially in verifying the values of existing damage criteria, damage and casualty estimation methods, target analysis techniques, and methods of selecting weapons, yields, burst heights, and desired ground zeros. The results of these analyses should assist in planning future atomic attacks.

Important, also, is the analysis of enemy atomic effort. An analysis of the enemy's use of atomic weapons will help determine the effectiveness of his intelligence system, including component collection agencies, the type targets which the

enemy considers profitable for atomic attack, and the time interval required to react to attack an atomic target. From this analysis G2 determines the enemy atomic capability and broad principles of employment. The commander can use this intelligence to determine:

1. The length of time during which units may concentrate with relative safety.
2. Which type activities or targets receive the greatest enemy attention.
3. Those enemy intelligence activities which have been most successful and which require special counterintelligence action.

A thorough examination of the enemy's methods of employment of atomic weapons may enhance our own employment through adoption of principles or techniques indicated in these analyses of enemy effort.

#### Planning Sequence Summary

The foregoing sequence of events involving the commander and staff in planning an atomic operation is summarized in tabular form below:

**PRIOR PLANNING:** Continuing study of enemy situation by staff to determine likely targets.

**INITIAL PLANNING:** Mission received.

*Planning guidance.* — Commander provides broad guidance on:

- General atomic plan.
- Damage desired.
- Assurance of damage.
- Contingent requirements.
- Troop safety.

*Preliminary planning conference.* — Staff presents to chief of staff recommended schemes of maneuver and atomic targets.

*Detailed target analysis.* — G3 coordinates the preparation of detailed analyses of targets carried forward from preliminary planning conference.

*Presentation of staff estimates.* —

Staff presents estimates to the commander.

**COMMANDER'S ESTIMATE, DECISION, CONCEPT OF OPERATION:** Commander announces his decision and concept of the planned operation.

**PREPARATION AND PUBLICATION OF OPERATION ORDER (PLAN):** Based on decision and concept, G3 prepares and publishes operation order or plan.

With the publication of the order or plan, staff planning is completed. The following steps constitute an execution phase of staff work, with the analysis of enemy atomic effort representing a continuing effort on the part of G2 and G3:

**IMPLEMENTATION AND SUPERVISION:** Commander and staff supervise operation.

**POST-STRIKE DAMAGE ASSESSMENT:** Staff and special teams conduct post-strike analysis to determine effectiveness of weapons.

**ANALYSIS OF ENEMY ATOMIC EFFORT:** G2 determines enemy atomic capability and broad principles of employment; G3 analyzes for vulnerability of friendly dispositions.

#### Streamlined Planning

The sequence of staff planning is unchanged by the consideration of atomic weapons except that when atomic weapons are employed, additional factors are considered in each step of the planning process. The staff planning process discussed may leave an impression with the reader that the process is slow and cumbersome. This is not necessarily the case. Staff planning, with or without atomic weapons, must be tailored to fit the time available. The planning sequence can be streamlined to fit the needs of the moment. In particular, staff planning procedures must be condensed for employment of atomic weapons against targets of opportunity. Probably the most time is consumed in making detailed target analyses. However, a target

analysis may be made in a very short time. Present methods of analysis are under study with a view to simplifying procedures to shorten the work and time required for detailed analyses.

One of the simplifying procedures is the construction of templates to give a quick graphic analysis of the results to be expected of an atomic burst. Designed around a given set of data, such as a specific yield and burst height, these templates are not new to the analyst, for many atomic weapons staff officers have developed their own in the course of exercises involving the use of atomic weapons for the express purpose of speeding up analysis procedures. For each anticipated or available yield or size of weapon, desired burst height, and map scale an individual template is required.

This creates no particular problem, since the analyst at tactical levels, such as corps and division, where it is expected that these templates will find best use, seldom deals with a large number of yields and map scales.

A set of these aids, called atomic damage templates (ADT), based on assumed "family" of yields, an assumed height of burst for each yield of the family, and a map scale of 1:50,000, has been developed. Their use, advantages, limitations, and method of construction are discussed in Department of the Army Pamphlet 39-1, *Atomic Weapons Employment*, and other publications.

The availability and use of atomic damage templates will not eliminate the use of the more detailed numerical system now being used in the Army. The numerical system, which is applicable to targets of any type, weapons of any yield, and different burst heights or damage criteria, will continue to find application at field army or joint force level, or at lower tactical levels when time is not a factor and a more comprehensive analysis is desired or required by the nature of the target.

### Control of Weapons

What echelon of command normally will be responsible for the tactical employment of atomic weapons? Atomic weapons and delivery means are not normally allocated lower than corps, current Department of the Army doctrine prescribes. The reasons for this position follow:

*Magnitude.*—The magnitude of the destructive effects of atomic weapons generally will transcend division boundaries, and hence require control by the next higher echelon of command, the corps.

*Exploitation force.*—The tactical advantages gained by the employment of atomic weapons indicate exploitation by units of division or larger size. The exploiting force should be a powerful, self-sustaining force of all arms, usually no smaller than a division.

*Range capabilities.*—A corps can better take full advantage of the range capabilities and flexibility of the atomic delivery agencies.

*Intelligence.*—Finally, at corps level, when compared with a division, the overall intelligence picture can be better evaluated.

Corps, in providing atomic support for its subordinate units, will frequently allocate the *fires* of atomic weapons as opposed to allocation of the actual weapons and delivery means.

Although it has been pointed out that weapons and delivery means normally will be allocated to corps, field army will retain control of some atomic weapons and delivery agencies. Detailed planning at higher echelon probably will be normal in the case of very large-yield weapons. Further, if the criterion is used that delivery means be retained at a sufficiently high level to ensure maximum use of their range capabilities, the field army will perform detailed planning for the employment of certain weapons.

Is the division commander out of the

picture so far as atomic weapons employment is concerned? No. Although detailed planning is done at corps at present, the advent of the atomic shell for the 8-inch howitzer and the possibility that science will produce even smaller packages—small both in physical size and yield or power—indicate that the division or other echelon may control the employment of tactical atomic weapons.

The value of an atomic capability under his own control is apparent when a division commander is assigned the mission of exploiting a breakthrough (where he may have the responsibility of the entire corps zone) or when his division is the covering force far ahead of the corps proper. Attachment of an 8-inch howitzer battalion and an allocation of atomic shells in these and other situations where the division operates more or less independently would provide the atomic punch to enhance the effectiveness of this powerful striking force and to bridge the gap which would be created with regular supporting units by such far-flung operations.

The employment of small-yield tactical weapons and the organic capability to deliver them appear to be destined for the division. Science and research need only to provide the weapons and delivery means; doctrine on their employment already will have been established.

Even without atomic means under his own control, the division commander will make recommendations to the corps commander for division requirements for atomic fire support. Actually, there is a need for concurrent planning between division and corps, because the control of atomic weapons by corps and the influence of these weapons on division operations coupled with the time element involved in their employment make it imperative. The same relationship is true between army and corps when detailed atomic planning which will affect corps operations is being carried out by army.

The division commander will require

target analysis to assist him in making his estimate and in making target recommendations to corps. Further, if the division commander has been allocated fires of atomic weapons to support his operations, his staff will perform the detailed planning for their use to include targets to be attacked, location of bursts, and times of attack. He will want detailed information on troop safety, creation of obstacles, damage to enemy units and installations in his area of operations, and the vulnerability of his own formations and dispositions to enemy atomic attack. This information is provided him by his G3 as a result of analysis of tentative enemy targets and of the dispositions of his own forces.

Since the allocation by corps of existing atomic weapons and delivery means to division is not precluded by current teaching, the factors and staff planning sequence discussed are equally applicable to the division commander and his staff.

#### Reorganization of Forces

While scientists work to improve weapons for the Armed Forces, the Armed Forces are working to determine improvements in organization and equipment which the advent of atomic warfare indicates is necessary. The Army is testing smaller, more mobile divisions and lesser units which, for survival in an atomic war, must be capable of moving rapidly from dispersed positions to the focal point of an attack, striking the enemy hard and fast, and dispersing quickly again to avoid the enemy's counterblows. These forces, moving fast and deep, may use the tremendous destructive power of atomic weapons to make up for a lack of troop strength. The adage attributed to the old West, "Smith & Wesson makes all men the same size," may have a present-day counterpart when the power of the atomic weapon is considered.

Of the many changes in battle concepts being pondered by the military minds,

there is one fundamental criterion for which there will be a continuing, even increased, need in whatever type army is adopted in the future. This is leadership—that displayed from the commander right down to the last soldier in the command. Here is what General John E. Dahlquist, now retired, thought about it in his article, "Leadership, 1956," in the January-February 1956 issue of *Armor*, while he commanded the Continental Army Command:

*Atomic warfare has increased the leadership burden. From the commander who decides the when and where of an atomic weapon to the man on the atom-blasted ground, the problems and pitfalls of modern war demand leadership of the highest order. . . .*

*Visualize an atom-blasted wasteland and one solitary soldier deciding how best to stop a powerful, determined enemy attack. What use is leadership against such odds? The answer is that leadership, and only leadership, can be applied to reduce the odds, possibly to an acceptable ratio.*

*Our solitary soldier finds arms on this apparent wasteland, he finds other soldiers, each of whom thought he was 'solitary.' The soldiers pool their skills, become a unit, and assess their strength and capabilities. Elsewhere in the wasteland,*

*other soldiers band together to form additional units through the same type of leadership. The enemy, expecting no resistance after the awesome blast, finds instead a resisting force, case-hardened and bent on revenge. The odds have been shortened and the attack blunted.*

As word of new developments in atomic weapons and delivery systems continue to reach the military, training in their capabilities and use must keep pace. Concurrent with this new knowledge of weapons, command and staff procedures to effect their use must be reviewed continually, simplified, and condensed to provide the minimum loss of time between target acquisition and time of strike if full advantage is to be taken of the combat power these weapons represent.

What the future will bring in organization, equipment, and weapons will be the result of today's evolution, but the men who will command these units, whatever the organization, are preparing now.

With the ultimate achieved in staff procedure and technique of planning for the tactical use of atomic weapons, a commander's guidance to the staff of the future may be simply, "Gentlemen, we will use atomic weapons."

Time will tell.

The American regard for human life is reflected in every aspect of the Army, and the process of substituting machines for men will continue as new developments come along. (Our allies' armies are following this same trend.) But here a word of warning. The ultimate extent to which machines can successfully replace men is one of the great unknowns in the modern world—it is so large an unknown that both the free world and its adversaries have seen fit to maintain large armies, notwithstanding the impact of new means of warfare. As long as there is a war, much of it will be fought on the ground, and that means men and machines.

Lieutenant General James M. Gavin

# Type Divisions for Atomic Warfare

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**W**HAT characteristics can best fit a division for fighting atomic warfare?

Before attempting to arrive at a solution to that question it is necessary to determine in what way atomic warfare will differ from conventional wars of the past.

Certainly, the use of atomic weapons will require further dispersion of units over wider areas resulting in a reduction of battlefield density. It has been generally accepted that dispersion in an atomic battle must not be obtained by increasing the distance between individuals, but rather by increasing the distance between these battalions. This solution provides a force, the battalion, with reasonable strength capable of accomplishing normal missions of attack and defense, while still minimizing as much as practicable the risk of huge losses by one enemy atomic strike.

Coupled with the increased dispersion is a requirement for increased mobility. If units are to operate over greater areas, they must be able to move faster over all types of terrain in order to concentrate, if necessary, for the accomplishment of the mission, or much of the fighting effectiveness of the unit will be lost.

Related to the decreased battlefield density is the need to use our forces more effectively. If only so many troops will operate within certain areas, we must be sure that the unit or units selected to do the job are those with the best capabilities under the particular conditions of terrain, mission, and enemy situation. In other words, commanders must be given an organization with a high degree of flexibility.

The tempo of the atomic battlefield with

wide dispersion, increased mobility, and organizational flexibility will demand decentralization of control and the use of mission type orders as commanders on the spot recognize quick changes and react rapidly to take advantage of them.

The magnitude of destruction of atomic weapons is much greater than anything we have experienced in the past, and commanders must expect the sudden loss of complete battalions and possibly larger units. Although 100 percent casualties will not always be the result, sufficient casualties will accrue so that a unit hit by an atomic weapon will lose its effectiveness. Such a unit must be evacuated from the battle area to the rear where it can be rehabilitated, reorganized, and trained for reemployment. In the meantime this unit must be replaced in the division by a like unit. Rotation of battalions is the direct result. For this reason divisions may periodically experience a change in their component parts.

## The Division Structure

The design of a division is the process of combining the various combat arms and services in the proper quantities to provide a unit with the desired characteristics or capabilities according to the types of missions and the terrain over which the division is expected to operate. The number of various combinations of arms and services is unlimited.

To get the most out of its component parts, the interior organization of the division is important. There are four major problems in this category—the nature of the building blocks, the span of control,

desirability or need for an echelon of command between battalion and division, and the regiment versus the combat command. Some of these problems are interrelated.

The parts or building blocks of the division may follow two completely different patterns—on the one hand, the “pure” battalions of infantry, artillery, armor, or engineers, as opposed to the integrated battalion or combat group which is organically composed of infantry, armor, artillery, and engineers.

The principal advantage of the former is that each infantry or tank battalion can be reinforced with the type and quantity of support it needs for each mission. Often the battalion commander may receive the support without the responsibility of supply and administration for the supporting unit.

The integrated battalion or combat group is more rigid and does not lend itself to the organization of battalion size task forces for each mission. One advantage of the combat group, however, is that since this unit has trained and lived together from activation, it forms a more closely knit team which should function more efficiently in battle. Thus is concluded that the flexibility afforded by the “pure” battalion concept is more desirable on the dispersed atomic battlefield and for that reason this concept will be used for the remainder of the article.

Since the beginning of World War II the United States Army has been organ-

ized so that the span of control be increased to four or even five major units. The principal objectives of these proposals are to reduce the number of headquarters involved in any organization and to provide more flexibility to tactical commanders by making available more combinations in which his subordinate units may be employed.

Experience has demonstrated on many occasions that commanders have successfully controlled four, five, or even more units at the various levels of command. There is much to be said in defense of the triangular organization, however. In general, our offensive tactical doctrine is based upon employment of three elements—a base of fire, a maneuvering force, and a reserve. A commander who controls five units must fit these units to this scheme and, in so doing, one or two of the elements must be composed of two or more units. For instance, a battalion commander of five rifle companies might employ one company as a base of fire, two as a maneuvering force, and two as a reserve. This situation poses the problem of unity of command or control of the two elements of the maneuvering force and the two elements of the reserve.

Defensively, control of four or five units is not so complicated since less movement is usually required. If, however, the defense reverts to a retrograde movement, the commander of five units will have more difficulty exercising control than will a commander of three or four units.

*A logical extension of current trends indicates that ground divisions should be tailored to provide maximum flexibility, increased mobility, and wide dispersion which commanders must possess in future combat*

ized on the triangular principle. This experience has proved that a commander can effectively control and employ three major subordinate units plus supporting troops. Among the newer theories proposed for future armies has been the recommenda-

One aspect of the effect of desired flexibility on span of control is the ability to organize and reorganize battalion combat teams or task forces as required for each mission. For example, the commander of an infantry battalion consisting normally

of three rifle companies can readily control an attached tank company since his span of control has only been increased to four. If on the other hand, the battalion organically has five rifle companies, the attachment of a tank company increases the span of control to six, and the point is reached where effective control by the battalion commander is doubtful. It is from this point of view that the truly effective width of the span of control must be determined.

An additional analysis of flexibility and span of control can be made at the division level. Using infantry as an example, a division consisting of eight battalions of three rifle companies each provides the division commander with more flexibility than a division consisting of five battalions of five rifle companies each although the rifle strength in both cases is approximately the same.

#### Consider Leadership Quality

Considering the problems of general mobilization in preparing for war and the tremendous expansion of our peacetime forces we might again see units commanded by officers who have rapidly moved up one, two, or even three grades. Better results might be obtained if our tactics and organization were kept simple based on expected average performance. It is unwise to organize unnecessary headquarters but, on the other hand, it is more unwise to provide so few headquarters that troops are forced to operate under lead-

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ers whose responsibilities have been extended beyond their capabilities.

The flow of orders from a headquarters to executing units may be accelerated by elimination of any intervening headquarters. Thus the receipt of orders by battalions to execute a division operation will be quicker if the regimental or combat command headquarters does not exist. On the other hand more time will be required by the division to prepare the order since it must be in more detail and since instead of developing three different missions for the regiments it must now develop five or more different missions, depending upon the number of battalions in the division.

In the past United States divisions have been well-known for their staying power in combat. The destructive capabilities of atomic weapons make this capability even more important. If the regimental or combat command echelon of command is eliminated from the division structure, the number of combat battalions of the division should be reduced to five or less to remain within the bounds of effective control. But by so doing, the effective strength is reduced and likewise its staying power is also decreased. The loss of one battalion of a five-battalion division by an atomic hit reduces the combat battalions of the division by 20 percent and the loss of the two battalions by 40 percent. Under these conditions the division rapidly loses its staying power and might have to be withdrawn from combat and take with it its combat support and administrative units. It is doubtful if this small division makes the most efficient use of these latter elements.

Retaining the necessity for the regimental echelon, should divisions be composed of combat commands or regiments? Organizationally, the regiment is a rigid unit composed of battalions dependent upon the regiment for some combat support and all administrative support. If battalions

are detached from the regiment, part of the regimental mortar, tank, medical, and service companies also should be detached. This condition is not conducive to flexibility at either division or regimental level. The regimental concept generally does provide conditions for good *esprit* and the development of a closely knit team of three battalions.

In comparison, the combat command has no set organization but is given certain battalions with which to perform the mission. The number and type of battalions attached to the combat command may be varied to fit the situation. These battalions are separate in that they organically have their own administrative support.

Some proponents of the regimental concept argue that there is nothing to prevent the exchange of battalions between regiments, which is true, but the present regimental organization does not lend itself to this flexibility as does that of the combat command. In view of the flexibility desired at this level for conduct of atomic warfare, the combat command concept is superior to the regimental concept. To assist in retaining the *esprit* of the regiment, the combat command organization could be adopted and given the title of the regiment.

#### Designing a Division

If any 10 officers with five years' or more service were each asked to design the division he thought could best meet the requirements of atomic warfare (or any other type warfare, for that matter), it is inevitable that 10 different organizations would result. Further, if these 10 officers have each served in combat in different areas throughout the world, the resulting division organizations would be even more different. This is a natural and expected result since "tactics is not an exact science" and most of us are influenced by our personal experience not only from the standpoint of terrain, but also

from the standpoint of characteristics of the enemy, the types of operations we have fought, and the type of organization to which we have belonged.

To illustrate the influence of terrain or area on the type of division, let us design some divisions for combat in different areas, concentrating on the combat arms, since space does not permit the necessary detailed analysis and discussion of the services.

For the component parts of the division a variety of types of battalions are available.

#### *Infantry*

Atomic warfare urges the consideration of a mechanized organization for all infantry battalions, not only those which habitually work with tanks, but also infantry used on purely infantry missions.

There are three proposed concepts for providing mechanization. The first is to equip all infantry units with armored personnel carriers; the second is to equip only some infantry units with armored personnel carriers; and the third is to organize a pool of armored personnel carriers in special units to be attached to infantry elements as needed. Under the first concept the logistical requirements of the field army will be increased considerably; also, there will be situations where, due to terrain, the armored personnel carriers cannot be used and must be left behind by the infantry unit.

The second concept has the same problems as the first but to a lesser degree. Additionally, this concept requires the shifting of the mechanized infantry battalions to areas where they will be needed and, admittedly, it is difficult to determine in advance where these areas will be. Neither the first nor second concepts provide for the mechanization of those elements which may accompany the mechanized infantry battalions such as engineer units or artillery forward observers.

The third concept reduces the logistic

support to a minimum, and requires only the movement of the personnel carriers to those predetermined areas where they will be needed, and makes provision for furnishing carriers to artillery forward observers and other units which may be accompanying the infantry. This concept poses the additional problem of temporarily marrying the armored carrier units to the infantry. The result, because of lack of association, will be somewhat less efficient than that obtained by an infantry unit whose carriers are organic.

All three systems would benefit from technological advancements, such as development of a lighter weight vehicle consuming less fuel, requiring less maintenance, and with better cross-country mobility.

Since the "pool" system offers the greatest prospect of flexibility this concept is adopted for this article and only one type of infantry battalion will be considered, that is the infantry battalion which organically is not mechanized.

#### Armor

The tank is well-suited for atomic warfare providing considerable protection against atomic effects and possessing cross-country mobility. The tank does have its limitations in the field of mobility, however, since it has a limited performance in mountainous areas, marshes, and woods, and it is not air transportable.

Desirably, the tank for atomic warfare should be much lighter. One possible weight saving field is a reduction in armor plate which, in turn, would permit a reduction in powerplant and the suspension system. Today's tanks can be knocked out by any one of a number of different antitank weapons such as the rocket launcher, the 106-mm recoilless rifle, and other tanks. By reducing the armor plate on the tank to that thickness required to protect the occupants from small arms and artillery fragments, the weight of the tank

can be reduced. Admittedly, the lighter tank would be vulnerable to antitank weapons and direct hits by artillery shells, but so is the present tank. The gain would be less fuel consumption (greater operating range without refueling), less maintenance, more speed, and a better cross-country mobility, with a resultant reduction in engineer requirements for roads and bridges.

Until the lighter tank is produced, the present 50-ton vehicle must be used. For the purpose of this discussion, consider that the tank battalion is similar to that of today.

#### Reconnaissance

The increased battlefield dispersion and mobility required for the conduct of atomic warfare has increased the requirement for the reconnaissance function. For this analysis and discussion, consider the reconnaissance company and battalion similar to that found in the present armored division. Further test and development of the "SKYCAV"<sup>1</sup> concept may show that this unit also will be one of the division "building blocks."

#### Artillery

Atomic warfare still will require a capability within the division for conventional artillery fire. One of the disadvantages of the atomic warhead is the relatively wide safety area required between ground zero and the location of the forward elements of friendly forces. Enemy forces in this area will survive the atomic strike in varying degrees, and some can continue resistance against infantry and tank attacks. Conventional artillery fire in large volume will be required to support infantry and tank units in the defeat of the surviving enemy forces. For similar reasons conventional artillery fires also will be required in close support of the defense.

<sup>1</sup> Colonel Stewart L. McKenney, "SKYCAV Operations During Exercise Sagebrush," *Military Review*, June 1956, pp 11-18

Placement of atomic fire delivery systems into the over-all organizational structure depends upon the degree of decentralization of the authority to employ atomic warheads. The lower the authority is granted, the more rapid will be the response to requests for atomic support. This decentralization must be tempered with the requirement for coordination before an atomic weapon is fired. The use of atomic weapons in support of battalion operations must be coordinated with adjacent battalions almost 100 percent of the time not only from the standpoint of troop safety but also from the standpoint of co-ordinating ground action to exploit the effects of the atomic weapon. Consequently, the battalion should not organically have its own atomic delivery system. Atomic fire support for the combat command also will require coordination with adjacent combat commands but to a lesser degree than at battalion level. For the same reason, then, the combat command should not have organic means for delivery of these weapons although in some situations atomic delivery means might be attached.

The area of operations of the division in atomic warfare probably will be much larger than in the past, and certainly will be if the size of the atomic warfare division is approximately the same size as the present division. At this level, therefore, it is feasible for the division to have its own means for delivery of atomic weapons of relatively small yields at ranges of interest to the division. Larger yields could be obtained from weapons delivered by corps and field army units. (It is assumed for the purpose of this article that an atomic delivery system light enough in weight and simple enough in operation to be considered as organic to the division does exist.)

The development of the ground-to-air guided missiles, such as the *Nike*, has given us a new concept for antiaircraft defense, namely, the area defense system.

Formerly, because of range limitations of the 90-mm antiaircraft artillery gun and others, antiaircraft defense was based on a point defense system. Weapons used to protect certain targets from attack by air had to be placed on the ground in the vicinity of the partial target. With the increased range of the guided missile this requirement no longer exists.

Applying this principle of area defense to the division area, it is conceivable that field army or corps antiaircraft guided missile units could provide antiaircraft protection to the division from positions outside the division area, or from positions within the division area, but retained under control of the field army or corps. This capability may result in eliminating the requirement for organic antiaircraft units in the division except in those situations, such as in mountainous terrain, where effective radar surveillance cannot be maintained.

#### *Engineer*

The need for an engineer unit in the division exists in atomic warfare, but emphasis on functions may change. If lighter weight vehicles can be produced, roads and bridges will carry less weight, and hence maintenance and construction requirements will decrease. On the other hand, there will be an increased requirement for the construction of airstrips to support larger numbers of Army aircraft and an increased requirement for the construction of friendly barriers and the reduction of enemy barriers.

#### *Armored Carrier Units*

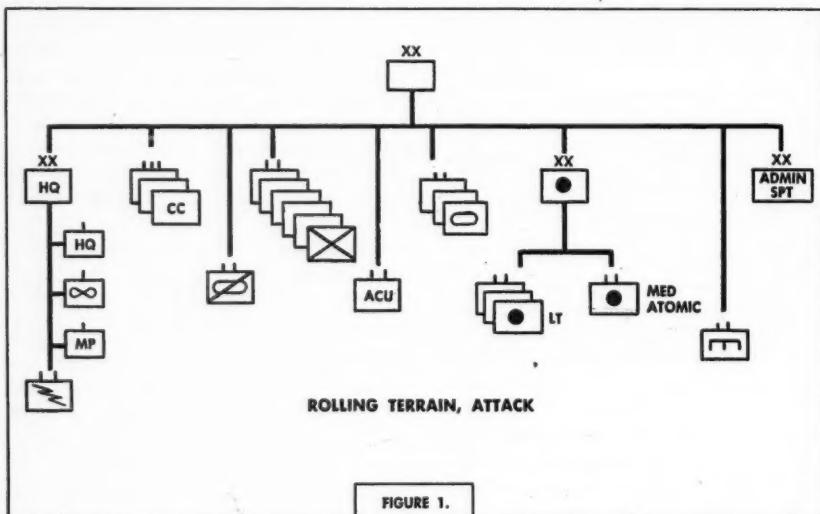
In view of the above discussion on infantry mechanization a special unit equipped with armored personnel carriers is necessary. Armored carrier units of battalion size may be assumed to have the capability of providing armored personnel carriers to mechanize three infantry battalions. It must be pointed out that

although the armored carrier unit principally provides armored transportation to infantry, it will be employed differently than a truck battalion. The latter may be given the relatively simple mission of moving the infantry unit from point A and dropping it at point B, but it is visualized that the armored carrier battalion will remain with the infantry units throughout an entire battle, or at least through certain phases of the battle even

#### **Rolling Terrain, Attack**

Assume that a division is to be designed for operation in "rolling" terrain such as that found in most of France and Germany (mountainous areas excluded), and further assume that this division is to be used *only* in the attack of hastily fortified enemy positions under conditions of atomic warfare. Figure 1 represents one solution to this problem.

The ratio of infantry to armor has been



**FIGURE 1.**

providing supporting fire with on-vehicle weapons.

Bearing in mind the foregoing discussion of the combat arms, and using a division organizational structure based on separate battalions and combat commands with an average desirable span of control of three or four, the problem of determining the division organization for atomic warfare can be analyzed by designing a division to perform selected missions under certain conditions of terrain. At this point no consideration is given as to whether that division should be "armored," "infantry," or "mechanized."

established as two to one by the inclusion of six infantry battalions and three tank battalions. Since the mission of the division visualizes attack of hastily fortified enemy positions the infantry arm should predominate. To give added battlefield mobility to the infantry an armored carrier unit has been included so that three (one-half of the total) infantry battalions can be mechanized at one time. The reconnaissance battalion gives the commander a means to screen open flanks, to screen those parts of his front from which he may want to withdraw infantry for concentration elsewhere, or to main-

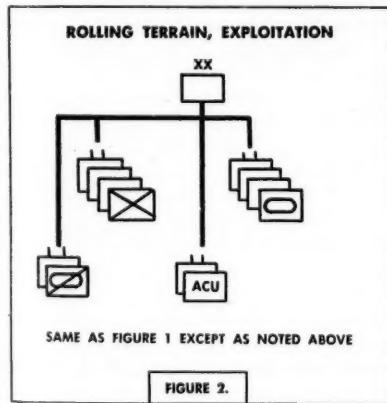
tain contact between relatively widely separated units.

Normal artillery support has been provided with three light artillery battalions and a medium artillery battalion. The latter has been given the capability of delivery of small-yield atomic warheads.

No organic antiaircraft units have been included since antiaircraft protection of the division area is provided by corps ground-to-air guided missiles. The type of terrain should offer no obstacles to the use of radar for detection of enemy aircraft and the missile guidance systems.

#### **Rolling Terrain, Exploitation**

Figure 2 shows a division organization to be used in the same terrain but for exploitation missions only. No change has



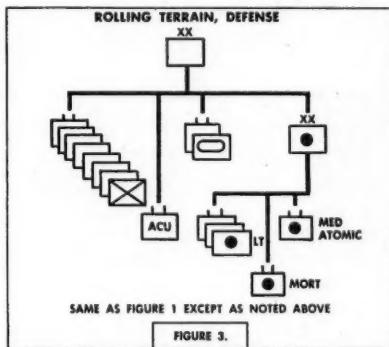
been made in the division headquarters units, engineers, or artillery since the requirements for these units would remain about the same.

The requirement for increased mobile firepower and shock action in this type of mission results in a change in the infantry-armor ratio to one to one. Two armored carrier battalions have been provided to mechanize all of the infantry plus some engineer, artillery, and headquarters elements. In the exploitation

the division will be operating over extremely dispersed distances deep into enemy areas; consequently, two reconnaissance battalions are included.

#### **Rolling Terrain, Defense**

On the atomic battlefield the execution of defensive missions is performed by using the extended form of the position defense or the mobile defense. For defensive operations in rolling terrain a division organization as shown in Figure 3 could effectively accomplish the mission. The differences between this divi-



sion and the attack division (Figure 1) are an increase in infantry battalions, a decrease in tank battalions, and the addition of a heavy mortar battalion to provide a large volume of close-in fires.

The armored carrier battalion is necessary for mechanization of the division reserve and/or of those forward infantry battalions which, as part of the division or combat command plan of the defense, will withdraw.

#### **Mountain Terrain, Attack**

Changing the terrain to that of a mountainous area, such as Korea and Northern Italy, and following the same system of organizational analysis, a division for attack missions might take the form as illustrated in Figure 4.

The major problem is to provide bat-

tlefield mobility in spite of the terrain. The area will afford little opportunity for the use of track laying or wheeled vehicles; consequently, other means must be used. In the illustrated division the number of infantry battalions has been selected as eight. No armored carrier units have been provided because of terrain but instead an aviation battalion is included. This unit is equipped with aircraft to perform the missions of the aviation company (Figure 1) and, in addition, has a large helicopter lift capability. An in-

follow the infantry more closely over the rugged terrain. Two heavy mortar battalions are added and one light artillery battalion dropped.

In mountainous areas antiaircraft radar will have difficulty in operating which will result in considerable dead space in the air defense system. To give antiaircraft coverage to these dead spaces, the division contains an automatic weapons antiaircraft battalion.

#### Mountain Terrain, Exploitation

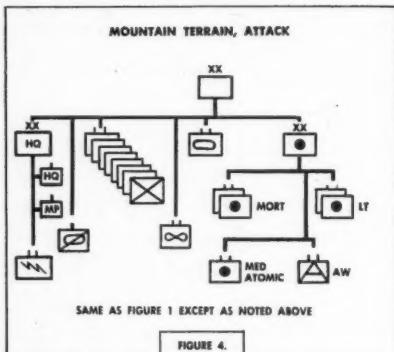
Increased mobility must be provided the division for execution of exploitation missions in mountainous terrain. Figure 5 shows a division organization modified from the one just discussed to give this mobility.

The number of infantry battalions has been reduced to seven and two Army aviation battalions (primarily helicopter) have been included. The armored carrier battalion permits mechanization of infantry for employment over whatever road net and flat terrain may be found in the valley floors. In the exploitation mission speed of movement around the enemy flank is necessary to encircle and entrap the enemy forces. This can be done in two ways, armored task forces moving over existing tank negotiable terrain and helicopterborne infantry task forces in the vertical envelopment. The reconnaissance element has been increased from a company to a battalion because of the larger area of operations in the exploitation.

The requirement for close-in indirect fire has been reduced somewhat and the long-range requirement increased; consequently, the mortars have been reduced to one battalion and the light artillery increased to three battalions.

#### Mountain Terrain, Defense

Under these conditions the trend is to a lesser requirement for mobility and an increase in close-in fire support. The organization, Figure 6, achieves this goal



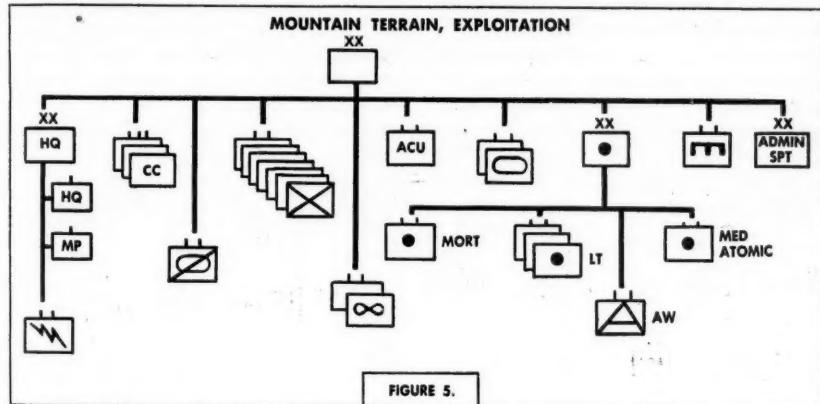
fantry battalion can be moved quickly by this unit in spite of the terrain. Supplies can be lifted from the road net in the valleys direct to the battalions and companies on the high ground.

Recognizing the likelihood that the terrain may permit some tank action, one battalion has been provided to give the division mobile firepower. The reconnaissance element has been reduced from a battalion to a company, again, due to limitations imposed by the limited road net normally available in mountain areas. When reconnaissance missions require more than one company they may be executed by infantry on foot with helicopter assistance.

The division artillery has been changed to increase the high trajectory firepower, and to provide artillery units which can

with a high infantry ratio, nine battalions, no armored carrier units, no tank units, a reduced reconnaissance capability, and three heavy mortar battalions.

On the other hand, the organization of 10 to 15 different types of divisions each designed for certain terrain and missions would be a poor solution since the juggling

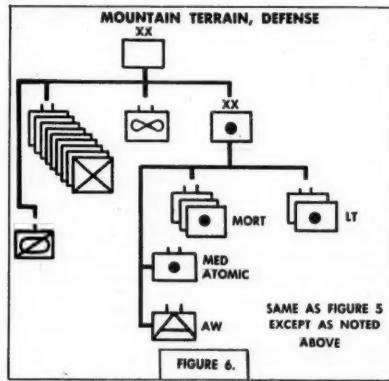


The defensive requirements for ammunition are generally high; therefore, an aviation battalion has been included not only to provide for movement of infantry units but to carry ammunition and other supplies to the infantry units on the higher ground where defensive positions are established.

Only six examples of the influence of mission and terrain on a division organization have been shown. There are many others. Under terrain conditions discussed there are other types of missions such as retrograde, attack of cities, and river crossings which would result in still different types of divisions. There are other types of terrain which would give even more variety such as jungle, desert, and arctic.

To accomplish all of these missions in various geographical locations the United States today has two types of divisions, the infantry and the armored. The inevitable result is that, on many occasions, the division is given a mission which it could accomplish more efficiently if its internal composition were different. On

the other hand, the organization of 10 to 15 different types of divisions each designed for certain terrain and missions would be a poor solution since the juggling



How can the criteria which have been developed so far be applied to another proposed solution—the tailored division?

#### The Tailored Division

The tailored division is not a universal division, which is a rigid organization designed by compromise to fit all situa-

tions. To the contrary, the tailored division operates like a combat command of an armored division in that it is given by attachment those battalions, by type and in number, which will permit the most efficient accomplishment of the mission in each situation. Such a division would have some organic units to form the framework such as a division headquar-

This solution may appear to be somewhat radical and present the picture of one wholesale scramble or movement of battalions between divisions on the battlefield. What might the results be in a given situation?

Assume a hypothetical situation of a corps composed of four identical divisions as shown in Figure 7.

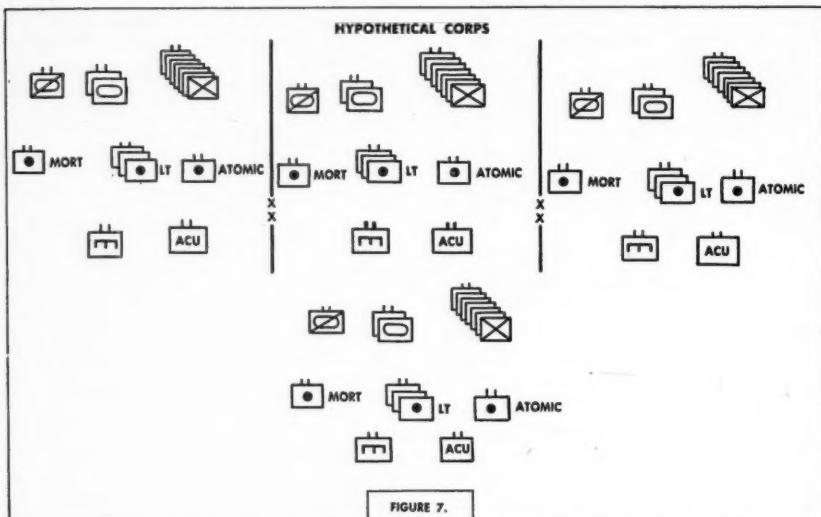


FIGURE 7.

ters, division artillery headquarters, combat command headquarters, military police, aviation company, and administrative support units. More may be included but only test and experience could establish firm requirements. To this framework are added infantry, tank, artillery, reconnaissance, and armored carrier battalions based on availability, mission, terrain, and enemy situation.

Certainly, such a concept would permit maximum flexibility from the battalion through the field army. It would provide the corps commander with a capability he does not now have. He could tailor his divisions for each battle and thereby get the most out of each type battalion.

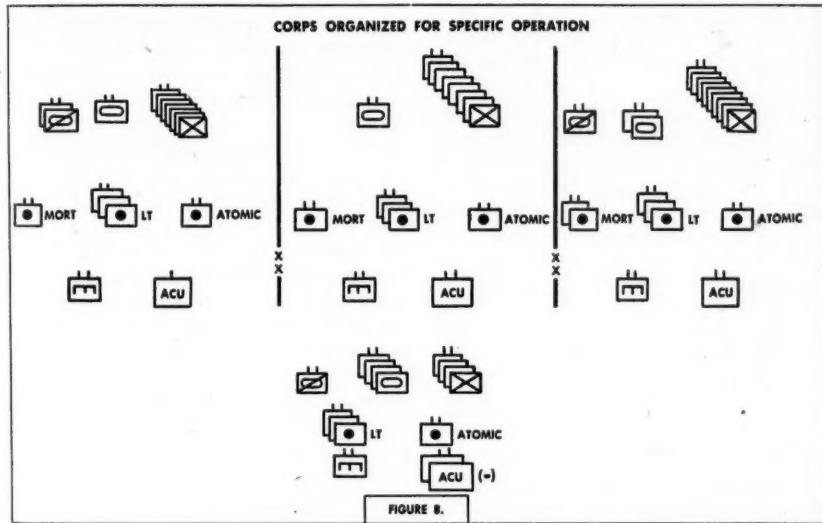
From this hypothetical situation let us assume a tactical mission. The corps commander has been given the task of seizing a certain objective and destroying enemy forces in his zone. His scheme of maneuver for accomplishing this mission consists of a main attack by the right division to penetrate the hastily fortified enemy positions to his front. This penetration will be exploited by his reserve division with a passage of lines by the reserve division when the penetration has been effected. The reserve (exploiting) division will be followed by the right division which will eliminate bypassed resistance in the corps zone and assist the reserve division in its mission.

The center division will assist the main attack by penetrating enemy positions to the front. The left division will also attack and will have the additional mission of protecting the open corps left flank.

Based on this scheme the corps commander decides he wants the reserve division to be completely mobile and to consist of an even balance of tanks and mechanized infantry. The right division, his initial main effort, should be weighted in comparison to the center and left and

Figure 7 compared to the divisions in Figure 8. Of a total of 68 battalions only seven plus part of an armored carrier battalion have been shifted, just a little more than 10 percent.

In this concept the corps commander must make changes among his divisions at opportune times, generally before the battle begins. Although minor changes logically could be made during the course of the battle, this practice should be avoided since it may require division or



should have an infantry, mechanized infantry, and tank capability so that it can quickly breach the enemy positions, and, on being passed through by the reserve division, it should have sufficient mobility to follow and mop up.

The center division composition should be similar to the right division but to a lesser degree. The left division should have a reconnaissance capability because of its screening mission.

Figure 8 shows the composition of the divisions for the task. Note the difference in division capabilities of those shown in

combat command commanders to change their plans at the last minute.

#### Advantages versus Disadvantages

Every concept has its desirable and undesirable features and the tailored division is no exception.

#### Advantages

1. Provides the maximum flexibility for combat operations to all commanders.—This is one of the requirements for atomic warfare. Within a theater of operations each type battalion can be used more

readily where it can best perform considering mission, terrain, and enemy situation. Divisions sent to a particular theater of operations can be tailored to fit the peculiarities of that theater before departure from the Zone of Interior.

2. *Provides the maximum adaptability for strategic mobility.*—In the case of air movement, for example, the division can be tailored to fit the means. Those units which cannot be transported by aircraft can be eliminated from the division. If the requirement exists on arrival at destination, and if available, the division may receive heavier units already in the theater.

3. *Provides improved battlefield deception.*—A division's organization and capabilities may be changed by movement of only a few battalions; under present organization when the capabilities of an armored division are needed the entire armored division must be moved into the proper area. Disclosure to the enemy (by capture of a prisoner, for instance) will not necessarily provide the enemy with the composition and strength of the division.

4. *Provides an organization well-suited for rotation of battalions.*—In atomic warfare there will be two requirements for troop rotation out of the battlefield area, first, those units which have been rendered ineffective by enemy atomic weapons and, secondly, those units which require rest and recuperation to reduce battle fatigue casualties.

In the former case the damaged unit is useless to its parent division for operations and the division must not be required to rehabilitate the battalion. The remnants of the battalion should be withdrawn to the rear, at least to the field army area, where replacements and equipment can be provided and a training program initiated to build up the effectiveness of the unit.

In the second case rotation from the

battle area of those units which have been exposed to heavy combat must be done at a low level. Division rotation is impractical. It is most unusual for all units of a division to require rest and recuperation to the same degree at the same time, and withdrawal of an entire division from a corps is a major operation requiring considerable revision of plans. The best rotation level is the battalion. The majority of the battalion personnel are exposed to the same degree of combat and are ready for rest at the same time. Withdrawal of a battalion from a division for this purpose is a relatively small operation and, if a replacement battalion is not readily available, the loss can be absorbed by the division.

#### *Disadvantages*

1. *The tailored division concept does not provide stability of units within the division and reduces the effectiveness of the teamwork of the units.*—In atomic warfare, as previously discussed, the composition of a division will change to some degree because of the requirement for rotation to rehabilitate units.

A division whose doctrine and training is based upon the flexible concept of the tailored division can overcome the effects of losing battalions for rotation easier than a division whose doctrine and training is more rigid.

2. *Division commanders and staffs will be required to change their mental outlook on operations.*—Today's infantry division operations focused on one battle will have to be refocused along lines similar to today's armored division operations which look ahead to the next battle. The rigors of atomic warfare will require commanders to possess the mental mobility and aggressiveness to shift their plans to take advantage of the rapidly changing situation. Training with the tailored division concept will prepare commanders to perform this function.

3. *The magnitude and type of the divi-*

sion administrative support requirement will vary as the division composition varies.

#### Airborne Operations

The tailored division concept is ideally suited to this type of combat. All airborne operations, to a degree, are tailored to fit the mission and availability of aircraft. Increased flexibility in the division would simplify airborne planning. The composition of the division could be designed to fit the situation of each operation exactly.

For the conduct of airborne missions the requirement for specially trained troops for the assault exists and to the types of battalions discussed above must be added additional battalions trained and equipped for airborne assault.

The flexibility of the tailored division would simplify air landing the followup echelon because the division's composition

could be designed to fit the situation exactly.

This review of some of the possibilities for divisional organization outlines the basic requirements which face divisions in an atomic war and the additional requirements likely to be imposed by specific missions and terrain. Flexibility and mobility must be foremost among the resulting capabilities of any division we care to design. A theoretical analysis of the tailored division concept indicates that this type of organization can provide these capabilities as a logical extension of current trends, and, in addition, can realize many collateral advantages. Further study and field testing, in the light of the criteria discussed herein, are necessary to arrive at more positive conclusions as to the extent of the possible benefits and the price which must be paid for them.

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In all areas—organization, tactics, equipment, weapons—the Army has turned the corner. We are continuously adapting ourselves to the requirements of warfare in the atomic age. We have weapons in the hands of our troops which can blast pinpoint targets with an atomic shell or warhead at long ranges. We are laying great emphasis upon the development of others that meet our requirements. It would be the gravest folly, however, for us to chain ourselves to atomic weapons. They would be useless in many situations during the course of any war, hot or cold.

The tools of war must be tailored to the particular job they have to do, just like any other tools. A pile driver is fine for building a wharf, but hardly useful for nailing the lid on a box. We are not interested in any weapon in any category merely because it makes the biggest bang or the biggest hole in the ground. We are interested only if it gives us the means to apply the exact amount of force required, and at the exact spot, to accomplish a specific task.

Each war has produced its share of "ultimate" weapons. Each succeeding war has found them reduced to a humbler status by the courage and ingenuity of brave men. We recognize this in the Army. We maintain a flexible attitude toward weaponry. Our goal is to put into the hands of our soldiers any and all new weapons that will extend their capability—not just one that may currently be considered "best" or "ultimate." There is no real ultimate weapon but man himself.

*Secretary of the Army Wilber M. Brucker*

# The Integrated Battle Group

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Faculty, Command and General Staff College

**A** GENERAL theory has been advanced that the basic tactical unit in atomic warfare must be a combined-arms battalion or an integrated battle group of all arms. It is further theorized that this battle group will operate with a minimum of control by higher headquarters over extended distances on a battlefield of greater fluidity and, consequently, must be semi-independent and self-contained. The purpose of this article is to consider whether such an organizational concept provides any significant improvement over existing organizational patterns for fighting in atomic warfare.

An integrated battle group is composed of balanced arms and services organically grouped into a battalion-size unit with a strength of 1,000 to 1,500 men. The concept of the integrated battle group, which will assume the role of the present battalion as the basic tactical unit, is a distinct departure from current doctrine in which the division is described as the smallest self-contained combat unit of the combined arms.

A desire for mobility and a visualization of dispersed operations in great depth have been the primary factors in the development of the integrated battle group concept. However, our own forces must be organized to permit the most efficient massing of means by the division and higher echelon commanders, especially if the efficiency and strength of the enemy ground forces are properly appreciated. Mobility, yes—but not necessarily fragmentation of power.

In a complex and controversial problem of this type, which is influenced by innumerable factors, it is necessary that certain limiting conditions be imposed and assumptions established to serve as a basis for discussion. Each of these factors is in itself a subject requiring exhaustive research and detailed analysis. However, rather than set forth pros and cons for each of the influencing factors, consideration will be limited to a mere statement of each factor:

This discussion envisions close combat in a general war against an enemy of at least equivalent means and strength.

The integrated battle group is a component of an infantry division operating as part of a larger force which includes airborne and armored divisions.

The battle group will include those units necessary to provide the administrative support now performed by regimental units.

The current ratio of combat arms and services will be maintained in the division of which the battle group is the basic tactical unit.

The matériel with which the group will be equipped is now in existence.

No doubt there are numerous additional influencing factors which could be enumerated. The only additional point to be covered here, however, concerns the scale of use of atomic weapons. The expression atomic warfare frequently is used rather broadly without adequate consideration

as to maximum yields and/or maximum numbers of atomic weapons to be used.

Many discussions are concerned with the effect of a single weapon of a stated and relatively low yield on a basic tactical unit. Often this is done for the purpose of comparing the vulnerability of that unit utilizing proposed tactical methods with a current basic tactical unit employing present-day doctrine. An apparent aim of such a discussion is to determine a minimum separation distance between tactical units to preclude simultaneous destruction of more than one unit by a single atomic weapon. Generally, the reader is left to his own devices to determine the impact on operations of multiple strikes or of the use of greater yields.

#### How to Achieve Dispersion

In the integrated battle group theory the requirement for dispersion between, but not within, battalions requires much more substantiation than has become evident. If it comes to a matter of trading units for weapons, and if we must state some formula, could it not eventually be the company, or the platoon, or even the squad? Even with a limited use of atomic weapons and dispersion of 5,000 yards between battalions, there is still the possibility that dispersion between companies within battalions, creating lesser inter-

vals between battalions, may be the better solution.

Actually, it is valid to conclude that the nature of combat operations must vary drastically, depending upon the numbers and the size yields of atomic weapons available to, and utilized by, the opposing forces. The problem, then, is one of describing a type of atomic warfare which

will provide a framework for the remainder of this discussion.

Insofar as size yield is concerned, an arbitrary assumption is made that only relatively low-yield weapons of two kilotons to a maximum of 75 kilotons will be used within the areas of the divisions in contact. It is further assumed that the effects of the use of atomic weapons to the rear of the division areas are beyond the scope of this article, and will not be of such degree as to nullify the discussion or statement of conclusions.

It would appear impossible to establish the maximum number of weapons available to a division or other tactical unit during a given period nor does it seem necessary. Rather, the situation can be defined as being one in which organization and operational procedures still can be somewhat similar to those which would exist if atomic weapons were not used. Tactical operations still will require the proper combining of fire and maneuver. Close combat will occur with great frequency. Atomic weapons availability will be so restricted that they normally must be reserved for use at the critical time and place.

We are not considering here, then, a scale of use of atomic weapons which would depopulate the battlefield, or require a complete abandonment of the entire

#### *Current concepts of organization represent net advantages over the integrated battle group theory, and offer division commanders greater flexibility and ability to make the maximum use of available means*

pattern of battalion, division, corps, and field army organization.

#### More Independent Action

The principle of independent or semi-independent operations by units of approximately battalion size has sprung from two primary causes: the requirement for dispersion because of the effects

of atomic weapons, and the desire for highly mobile or fluid type operations with a minimum total force requirement. In mobile fluid warfare, offensives will be aimed at the enemy's rear areas, and will be characterized by rapid violent action of short duration. The resulting picture is that the enemy's forward units will collapse because of the presence of forces in his rear, which will disrupt the command and logistical facilities and engage those reserves not disposed for combat.

Defensive operations will emphasize the defense in great depth of an area rather than of a line and circumstances will dictate whether the commander will adopt the extended position defense or the mobile defense, with the latter being the usual aim for a fluid battlefield. Every effort will be made to utilize mobility to the maximum extent in defensive as well as offensive operations.

A rough idea of the separation distance between units, such as the proposed battle group, should be established to provide a basis for meaningful discussion. What is involved essentially is control over territory—by firepower and mobility. Considering only the latter, the separation permitted can be roughly proportional to the integral movement

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capability of the unit. In the case of our current infantry battalion, with a speed of two miles an hour on foot, the normal breadth of this area is approximately 1,000 yards. By providing armored carriers, with an average tactical speed of 10 miles an hour, can it not be considered that the battalion zone of control will readily be extended to 5,000 yards?

This is not necessarily true, but it can be used to permit a more specific visualization of approximate intervals between battalion-size units and the degree of independent operational capability required of such units. The separation distance required for protection against the effects of atomic weapons varies with the size of weapons. Current thinking is that protection can be accomplished best by dispersion between, rather than within, basic units so that two adjacent units will not be significantly damaged by a single weapon bursting midway between them. Assuming that the maximum yield used tactically will be 75 kilotons and using data from Department of the Army Pamphlet 39-1, *Tactical Employment of Atomic Weapons, Unclassified Effects*, the minimum distance between centers of mass of adjacent units will be something like 3,500 yards when troops are in lightly armored vehicles of the M59 type or medium to deep foxholes.

Hence under the conditions of fluid type atomic warfare, adjacent basic tactical units very likely will operate with intervals of 3,500 to 5,000 yards between their centers of mass. Operations by basic tactical units at these intervals introduce certain problems, the most obvious of which is the control of the unoccupied areas.

#### Infiltration Problem

Experience indicates large-scale infiltration will not be a problem in offensive action. A hard-hitting, fast-moving mobile force creates terror and panic, and by its

very nature will cause enemy infiltrating elements to attempt escape rather than try to conduct harassing operations against support installations.

Infiltration will present a real danger in defensive operations and will be of a greater magnitude than in today's non-atomic operations; but this problem is not unsolvable. Although the commander must resort to wide separation for protection against atomic attack, the situation is similar to past conditions when a commander was assigned the defense of an extensive sector that required wide separation between battalions. The skillful use of terrain, observation and listening posts, and helicopterborne and armored carrier mounted patrols can do much to keep infiltration within manageable limits.

Another difficulty associated with wide separation is that lack of mutual support between units may result in defeat in detail. Thus as intervals increase it is necessary to maintain an adequate mutual support capability by concurrently providing the units with increased firepower and mobility.

#### Required Means

Having established some of the operational factors which appear to be pertinent to the battle group theory, means to be utilized must be considered. If artillery is organic to integrated battle groups, the requirement for mutual fire support between such groups is influenced by the capability of the next higher echelon to provide additional fire support. If the fire support capability of the next higher echelon is adequate to support the basic tactical units operating at extended distances, then mutual support between units is no longer an overriding requirement. Additionally, given adequate mobility the battle group will be able to close the interval rapidly in emergencies and place its principal weapons within range of the adjacent units. The artillery should be organized so that it can be employed cen-

trally in mass or decentralized within the battle group. To enable the artillery element to perform either function, they must be equipped with an armor protected vehicle having mobility approaching that of the infantry. The 105-mm howitzer, self-propelled, *T98E1* has these characteristics.

The general nature of tactical operations establishes the requirements for improved mobility and increased protection. The aerial vehicle best meets the requirement for improved mobility because it is comparatively unaffected by adverse terrain conditions, but for the immediate future it is difficult to visualize all the matériel needed for ground combat being moved habitually by air. There will be a requirement for aerial transportation of portions of the battle group but transportation by air will not be the usual method. The battle group frequently will employ its rifle elements in vertical envelopments in conjunction with hard striking penetrations to effect a quick link-up. The heavy equipment will move on the ground behind the penetrating force to rejoin the air-lifted troops. Since aerial mobility of all elements will not be feasible, improvement in the ability to move on the ground must be sought.

#### Armor Benefits

To achieve the required degree of cross-country mobility, the vehicles employed must be capable of habitual off-the-road operation over all types of terrain. The *M59* armored infantry vehicle fulfills this requirement. The bonus benefits of such a means of transportation will be many. It will provide greater flexibility to ground operations by reducing the dependence on roads and trails in forward areas. The strength of the fighting man will be conserved while he is moving to the scene of action. The food, water, and ammunition which can be transported in the carrier will add substantially to the sustained combat power of both the indi-

vidual and the unit. Another significant result from the use of the armor protected carriers will be the lessening of the thermal and other effects of atomic weapons.

Fast-moving operations over extended distances will require a logistical support system capable of immediate response to the needs of the tactical units which will carry only the barest essentials to sustain operations for the minimum amount of time. This means that minimal reserve stocks will be transported by tactical units, preferably only those which can be included within the basic load of each vehicle. To meet these conditions the transport of the logistical system will require mobility at least equal to the mobility of the battle group. Increased use of aerial vehicles best satisfies this requirement.

#### The Battle Group

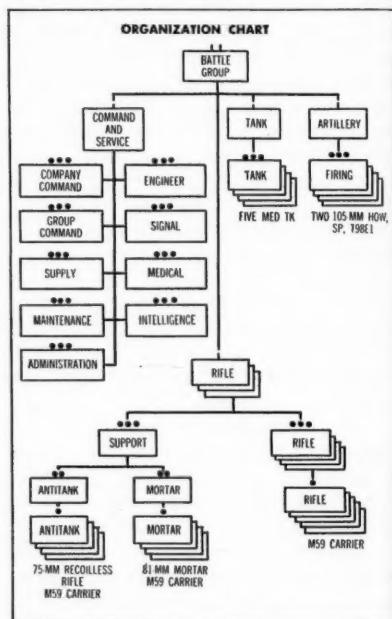
A possible organization for the battle group is shown on the chart. No attempt will be made to explain or justify this model in all its aspects, and only the most significant factors will be discussed.

Before the number of infantry elements can be determined, the span of control must be established. Two spaces of the optimum span will be occupied by the tank and the artillery elements. Although an optimum span of control has not been firmly established, many authorities in the field of management put it at between three and seven. It seems rather obvious that as the characteristics of the included elements vary, the number within the span of control must also vary. Considering these influencing principles, three infantry companies are visualized thus resulting in a span of control for the group commander of five combat elements.

The tank company and the artillery company will be organized into four identical platoons to facilitate the forming of three reinforced rifle company task forces when required. The tank and artillery platoons will be available as additional

reinforcing units or employed with the command and service company as local defense troops when the group is operating with reinforced rifle companies.

Having defined the integrated battle group, adopted certain limiting assumptions, and portrayed some of the conditions of combat which advocates of the group appear to have in mind, the advantages and disadvantages of the concept



should be enumerated together with conclusions as to its probable net worth.

True benefits, or advantages and disadvantages of a concept, can vary with one's point of view. It is probable in many cases that the battalion commander's idea as to the best solution will not correspond to that of the division commander. Although in such case one might sympathize with the combat commander on the ground, the over-all advantage to the force of any concept must be the controlling factor.

### Advantages

1. Regardless of the nature of tactical operations in which it may be employed the battle group permits cohesive action independent of outside sources. The composition of the battle group, organized on a permanent basis, facilitates independent operations and the functioning of these groups when widely separated from each other. Innumerable times in the past, it has been necessary to form small task forces of more than one of the combat arms and services; these forces were more or less self-sustaining on relatively independent operations.

It has not been proved conclusively that separation of 3,500 to 5,000 yards between battle groups requires the capability for semi-independent operations. When conditions require a battalion-size unit or battle group to operate at greater intervals, of perhaps 6,000 to 10,000 yards, they should possess this operational capability.

2. Within the battle group the combat capabilities of the various arms are under the direction of a single commander and are immediately available to him for employment. This feature also facilitates decentralization of operations and a consequent lessening of need for continuous control by higher headquarters.

3. From the viewpoint of the next higher commander, an organization of several integrated battle groups offers a possible advantage of interchangeability and quick responsiveness to command, for all battle groups theoretically have identical combat capabilities. Units can be moved rapidly with at least some degree of essential support and in emergencies the most readily available unit can do a job that any other could do. Additionally, there may be some benefit to a package type replacement of self-contained units in their entirety.

4. A permanently constituted unit such as the battle group offers all the advan-

tages that accrue from long association and mutual respect of its members. Team-work is enhanced, and teamwork in its final essence is the ingredient that ensures a maximum realization of available combat power. Identification with the unit, a sense of belonging, and a feeling of contributing a worthwhile effort can be more readily instilled in the members of a self-contained, semi-independent unit that is never fragmented.

5. The armor and artillery units of the battle group may gain a certain degree of security from ground attack by always being closely associated with a sizable infantry force or contained within its perimeter. If infiltration by enemy units of appreciable size presents a problem, considerable security will be afforded to artillery units emplaced forward to provide maximum firepower support.

### Disadvantages

1. From the point of view of the division commander, decentralization of means to the battle groups could represent a distinct disadvantage. Centralized control enables a commander to mass his supporting arms with greater efficiency. Artillery fires can be massed quickly and shifted to various portions of the combat area. In a division comprised of battle groups the possible lack of ability to mass and maneuver conventional fires effectively would represent a great disadvantage. The availability of atomic weapons may neutralize this disadvantage to a considerable degree, but since the scale of atomic war considered is such that maneuver of units and concentration of conventional firepower still is necessary, then the massing of firepower remains desirable.

2. Similarly, tanks cannot be employed in mass without a considerable reorganization since no single command headquarters would be available to control those tank units organically assigned to the battle groups. The same lack of control

structure applies to the fragmented engineer force.

3. If the situation requires a different ratio of combat arms than found in the organic battle group, the next higher echelon cannot readily form task forces weighted to the particular task. This results in a lack of flexibility in being able to tailor forces for unforeseen circumstances. For example, in the simultaneous employment of several battle groups some tanks may be disposed over very inferior tank terrain while insufficient tanks are disposed over terrain favorable for the employment of massed armor.

4. The inclusion of the direct support artillery element within the battle group may result in its being more vulnerable to interference from ground action. This is particularly true with regard to the artillery of a battle group occupying the most forward combat positions. In addition, the requirement for provision of adequate protection to the artillery might necessitate the group forming a perimeter actually exceeding the security capability of the infantry elements.

5. Infantry and artillery, with different characteristics and capabilities, seldom seek the same type of terrain for positions from which to perform their missions. Organic combination of two elements with such divergent position requirements is a serious disadvantage.

6. Combining the arms at the battle group level adds a difficult training and control problem. A commander at this echelon normally will not be equipped with a staff capable of assisting him in the attainment of a high degree of combat efficiency in several units from different combat arms all requiring varied degrees of diverse technical knowledge. Control and direction of these varied elements will impose additional requirements on a front-line commander who should be primarily

concerned with critical tactical operations. Also, if the artillery, armor, and engineer functions are fragmented to relatively small units with junior commanders, there is the question of the source of the experienced professional staff advice on these functions that is required at the various division command echelons.

7. The combination of the integrated battle group concept and the idea that there will be dispersion between, but not within, such groups will result in a concentration of maximum activity in certain specific areas of the division zone. This probably will facilitate target detection by the enemy. Once he has determined our *modus operandi* his information gathering agencies can concentrate on the areas of greatest activity, and he will be better able to obtain maximum efficiency from the use of his atomic weapons.

### Conclusions

Considering the assumptions on which this article was based and the resulting visualization of the probable nature of operations, it is concluded that the current concepts of organization represent a net advantage over the integrated battle group theory. This conclusion is based essentially on the following points:

1. It has not been conclusively demonstrated that operations in atomic warfare are likely to follow a principle of dispersion between, but not within, units of approximately battalion size.

2. The current concepts of organization offer net advantages to the division commander in flexibility and in the ability to make maximum use of his total means against a powerful enemy force. This is not found in the battle group concept because of the fragmenting of combat support units, although this contributes in some respects to the mobility capability of the force.

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# RAPPORT

Lieutenant Colonel John Clapper, Jr., *Signal Corps*  
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**T**HE gray shadows of ancient history hide the secret of who first said, "To win we must fight as a team." Perhaps it was some fur-clad family that long ago foraged the forest for food, armed only with spears and clubs. Whatever its origin, the statement stands out today as an axiom, "A leader and his aids must be in rapport."

Today, if military forces are to survive and win on the atomic battlefield, the demands for close teamwork, complete integration of surveillance, reporting, analyzing, directing, and supervising functions are vital. To talk of a weapons system is to speak in terms of a coordinated and controlled organization of interdependent elements which reaches its full stature because a means exists within the structure for regulating, guiding, and managing its utilization. But let us develop the picture from a simple beginning—"IN RAPPORT."

Picture the football team. An armlocked huddle just before each play provides the essential bond which ties the individual players together for coordination and direction. So essential is the element of direction of the group effort that after only a single play the team must be reassembled for a new whispered command. Effective command and control of the 11-man offensive team requires several such assemblies every minute of play.

In military operations a point of similarity can be found in the combat patrol. Before his patrol moves out the leader assembles his men to assess their capabilities, to review the situation, to state the mission, to organize and delegate duties to each man, and finally, to establish the means by which he will control them in the face of the enemy, whatever develops.

As combat forces grow in size the control problem becomes more complex. It reaches its zenith in atomic operations where dispersion between units makes the huddle impossible. Thinly defended areas between units, and greater distances to travel combine to limit the visits of the commander to his units. The old system of a series of command huddles all over the battlefield has given way to more dependence upon standing operating procedures, set plays, and the application of remote control. Yet, even as these techniques are emerging, there is a greater accent on quick reaction. Speed is of the essence in atomic combat situations, whether it be on the offense or the defense.

This matter of arranging procedures for passing information up and down the line, calling for and providing mutual support, and directing the maneuver of the group applies equally in principle all the way from the simple example of a handful of men, up to and including the complex operations of powerful forma-

***We must develop military command and control systems based on mobile, high-speed, accurate electronic communications if we are to achieve close coordination of combat and logistical forces essential to victory***

tions equipped with the most awesome weapons of modern war.

Military signaling is vital. Great schemes are dependent upon the tangible and intangible links between those who direct and those who execute. Unable to hold the little huddle of the football field, the leader's personal contact must be introduced and maintained by other measures. So it is then that every military leader wants and needs to make his personal presence felt. Short of actually being with those who must carry out directives, the commander, his staff, and his operational control agencies must rely on a communications-electronics system to tie them in to intimate, if not close physical contact with those who respond to their orders.

### Building the Battle Team

Since modern man has changed but little over the centuries, physiologically speaking, the improvement and development of the battle team has centered about new weapons, improved matériel, and better communications—more effective ways to shoot, move, and communicate.

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As much as vanity may resist the admission, bravery and steadfastness are age-old virtues. Regardless of new weapons, battlefield gadgetry, and high morale, tomorrow's armies will be no bolder nor determined in the face of adversity than were the Roman Legions or valiant Allied defenders of freedom in World War II. They stood fast in the face of their fears and doubts because leadership got through to them, and welded them into highly effective battle groups. Tomorrow, then, we must have the command and control which spells the difference between a team and a mob.

Once needs are known and stated, progress is under way. The fundamental sequence of filling the requirements should fit generally into this pattern:

1. The development of a new concept of future war in accord with national objectives.
2. The determination of the requirements in organization and equipment.
3. The determination of the weapons necessary.
4. The generation of tactics and doctrine required to exploit fully the potential capability of new weapons and matériel.
5. The evolution of the requisite means to effectively command and control the agencies involved in using the new capability.

Throughout the history of warfare there has been an inherent resistance to change. Despite the constant hue and cry for more means to reach the final victory with greater certainty, individual bias and inability to visualize clearly the over-all picture has led to many delays and failures to exploit new fields. Looking at the precepts of progress stated above, we can recognize that the greatest military champions were those who not only had the advantage of superior battle hardware, but also developed the technique to get the most out of what they had.

### The Challenge

The great challenge then is to place sufficient stress and emphasis on all phases of development to acquire the maximum return from our inventory of assets. Although this article is concerned primarily with the last phase, the evolution of the requisite means to effectively command and control the agencies involved in using a military capability, the other elements should not be regarded as having been slighted. Naturally the last phase is dependent upon the preceding ones, and may well be developed concurrently with them.

Today, the Army boasts greater fire-power and increased mobility and flexibility. *Only with top quality communications can we reap their full promise.* The development of new tactics, organization, and doctrine to exploit greater potentialities is being conducted zealously. Both combat and logistical operations in the fluid battles of tomorrow call for providing the control elements with a wealth of up-to-the-minute information about conditions over a large battle area. Once gathered, information must be filtered and forwarded to those who must evaluate it and revise their estimates of the situation in line with their findings. Decisions must be rapid and accurate to a degree not formerly required. And throughout the process, the system must be capable of furnishing excellent and uninterrupted communications, no matter what actions the enemy takes or what weapons he uses.

The temptation is to treat the requirements for a staff or operations control group as one entity, and to regard the requirements for a communications-electronics system which serves the control group and ties it into the subordinate action agencies as a separate and distinct package. The fault in such a view lies in a lack of appreciation for the close interrelationship between the parts. Compare the human cerebrospinal/automatic system and military response/control mech-

anisms. The point to be drawn is that human sensory perceptors, nerve ganglia, central conscious and peripheral unconscious response control centers, and motor impulse or reaction media are all bound into a compact unity. Psychologists advise that nerves and nerve centers directly condition behavior and consciousness. It is worthwhile to note in passing that man is physically superior to other vertebrates because he has a more highly developed central nervous system.

The military central nervous system for the battle area of the future must control battle groups of all arms, moving over greater zones of influence, and must provide for rapid and adequate logistical support. Units will assemble and disperse with rapid changes in density, yet always retaining the essence of one mass. The ability, through great mobility, to concentrate and strike, and then to recoil and later exploit the devastation caused by attacks of sudden ferocity places a premium on battle area surveillance, interpretation at the operation control center, and the transmission of the reaction impulse. Human eyes and ears will be supplemented by radars, seismic and acoustic detectors, and remote airborne and ground positioned photosensitive reporting devices which are linked into integrators at response centers.

In the ultimate system, information from lower echelon data collecting and mixing centers will be reported periodically to higher echelon control centers by means of unattended electronic devices which also will respond with the latest data upon interrogation impulses from a higher echelon. The data thus transmitted will be stored, integrated, and assessed electromechanically to the limit of human ingenuity. Prearranged response patterns, warnings, and summaries can be presented visually, stored automatically, or typed for future study by controllers. As the quantity of incoming data in-

creases, it will be imperative that clerical operations be performed by machines.

#### CP's Will Move Often

Atomic battle concepts clearly establish the need for effective communications at all levels in the field army. Command posts, even at corps and army levels, must be highly mobile. Division CP's will move as often as once a day. Corps CP's will move as often as every two or three days, and Army CP's will displace at intervals of a week or less.

Frequent displacement makes it mandatory that all signal equipment be as mobile as the headquarters it supports. Switchboards, radio relay stations, and other facilities must be mounted in small trucks no larger than the types used by the staff sections of the headquarters. Radio communication must be continuous, even during displacement, with local direction of incoming and outgoing calls to operating staff officers by means of radio switching centers. Power units must be mounted on vehicles, and fed from central fuel tanks. Antennas for even relatively elaborate radio relay stations should be so designed that they can be put up and into operation in minutes. No setting up should be required inside a truck or van. Its equipment should be ready for use instantly. Local wire lines in the CP should be fanned out as fast as men can run, with an over-all result that displacement of a CP ceases to be much of a problem.

Instead of wire lines between echelons, highly directional radio relay networks will be normal. The grid system must have the capacity and reliability to provide full switchboard-to-switchboard service on a common-user basis, and also such private or sole user channels as are necessary. All transmissions must be coded automatically or scrambled with no time delay.

The destructive capability of atomic weapons and the requirement for fast, re-

liable, and uninterrupted communications for the control of battle groups of all arms operating over wide areas as well as for rapid, adequate logistical support, outmode the familiar single axis communications system shown in Figure 1. The blast depicted, or one severing the main axis from division main to division rear, would cause completely unacceptable disruption of the tactical, administrative, and logistical operations and control.

Figure 2 clearly shows the superior resilience and flexibility of the grid communications system. It is apparent that even complete destruction of the switching center at the hub of the system would not cause more than momentary interruption of vital communications. In fact, an enemy would find it costly and difficult, if not impossible, to disrupt communications completely—particularly if primary reliance is on radio communications. Unaffected switching centers merely would tie in with each other and nearby units and business would carry on as usual.

The radio central terminal of a future division command echelon is visualized in Figure 3. The advantages of this integrated use of advanced communications are obvious.

At lower echelons the use of tactical radio gear must be expanded. Small multi-channel radio relay sets can be developed which provide eight voice and two teletype channels, identical to wire service. The artillery, infantry, and armor will all have the same basic vehicular radio set, with hundreds of channels for suitable allocation. Fully integrated battle teams thus will be possible, with no frequency problem or inability to reach to units of another arm.

#### Administrative Support

Just as the combat operation of the future will be molded into an entity of weapons and control systems, so also must the administrative and logistical capability

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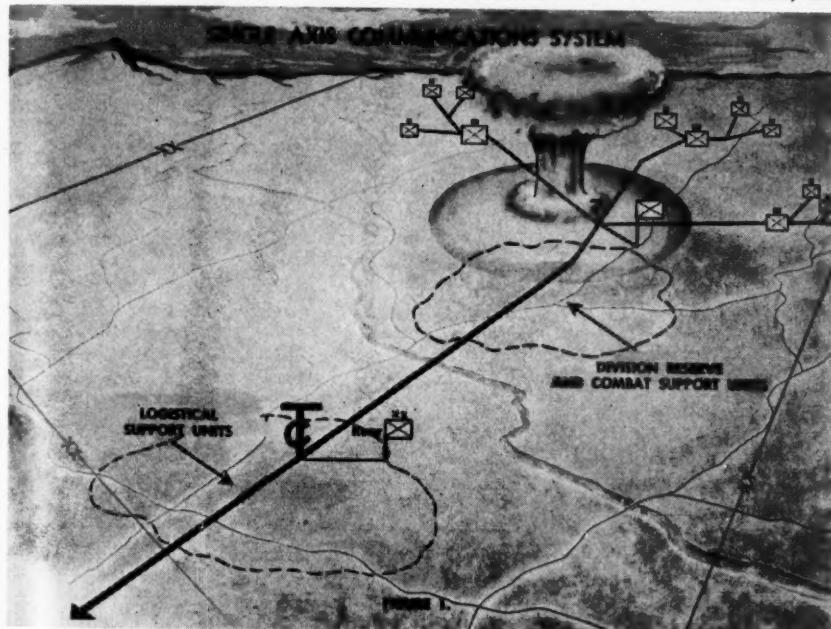
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be streamlined. Without fully adequate logistical support commanders in the atomic era cannot execute their tactical plans. To keep pace, smaller and more responsive service organizations, better operating procedures, faster transportation, and improved communication techniques are necessary.

The more quickly and surely we can deliver supplies to the battle area, to the

sponsive supply and maintenance chain to help increase tactical mobility. In the absence of superior logistical control communication facilities, the whole idea is little more than a dream.

If such a system is to work effectively, "green light" supply procedures must be used. Theater policy will set forth authorizations and allocations. Control will be more centralized on critical items, less



right place at the right time, the less requirement there is for combat and combat support units to carry large reserve stocks. Items used frequently in quantity will be called for and must be delivered rapidly as needed. The better the service from rear to front, the smaller the forward stocks on hand will need to be. Bulky supplies will be held in the rear until required and shipped quickly to the consumer on order. The desired effect is the development of a smaller but more re-

on plentiful stocks. Operations will be decentralized. Hoarding by using units will be denied by limiting transportation capability to that which will carry authorized levels only. The cumbersome multiple-item requisition of the present will be replaced in the future by single line item requisitions transmitted over wire or radio circuits from regimental and higher headquarters.

Stock and supply control will be built around electronic computers and inte-

grators. Simple, uniform methods will be standardized, accelerating the flow of data and reducing order and delivery lead time. Aided by electronic data transmission techniques, the development of a highly responsive logistical system, long

phone calls and message transmissions. Thus a network of high quality communication circuits will be necessary to ensure continuous management over operations in rear areas. Multichannel facilities will be necessary to pass this heavy traffic

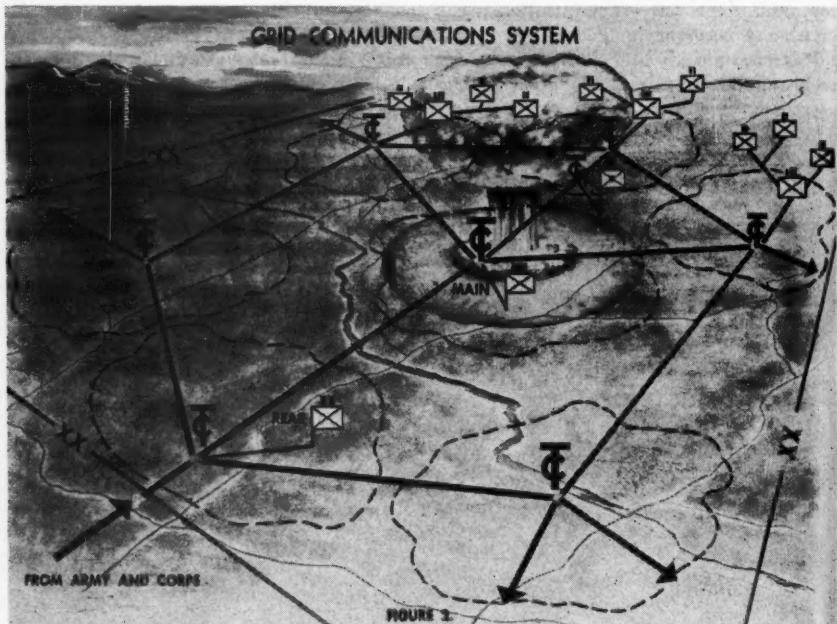


FIGURE 3

the dream of field commanders, may very well be one of the first major breakthroughs to the Army of the future.

It is imperative that machines free staff officers from the burden of manually performing every repetitive process not involving a high degree of judgment. Operation control centers must be uncluttered and quiet, yet highly responsive to the decision-making process. Delays in transmission can and will be eliminated once procedures are developed by officers specially trained to work out the complex relationships of all parts of the system. The command and control of administrative activities involves a myriad of tele-

over long distances by means of an area or "grid" system.

#### Army Aviation Flight Control

The form and nature of future tactical and logistical operations will be influenced greatly by increased use of Army aircraft. Army air operations will be conducted in all weather, at all hours, usually at low altitudes over electronically defined air routes. Communication and traffic control will cause the orderly movement of large numbers of planes, fully coordinated with tactical air support and antiaircraft defense.

The basic principles of flight control

operations are not new. The United States Navy, the United States Air Force, and the Civil Aeronautics Authority are rich sources of guidance. However, certain unique requirements of the Army have no outside counterpart which can be exploited. Army airfields will be created hastily, and heliports will mushroom wherever the tactical situation dictates. Communication, air navigation, en route flight assistance,

and applying them properly. As a truth is recognized as being generally applicable, the details behind it lose much of their mystery. The more intricate problems of military signaling are being studied and solved by forward thinking officers who plan to use communications, not as technicians, but as commanders.

In the final analysis the commander who figuratively subdivides his control

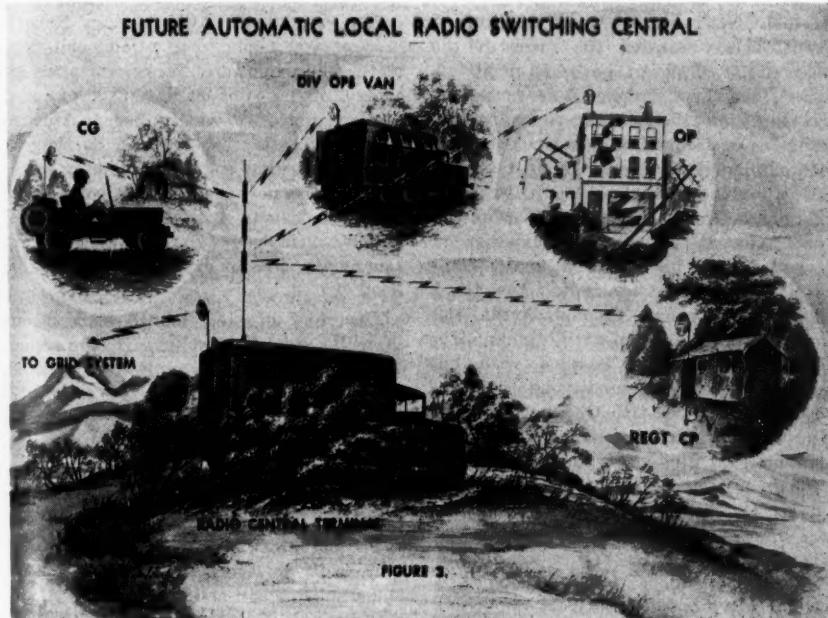


FIGURE 3.

and landing aids for the field army will be "here today, there tomorrow." Only by the most carefully integrated system of command, control, and communications-electronics will the Army's own control over its flight operations meet expectations.

#### RAPPORT

The fundamental test of understanding comes from uncovering basic principles

system into its parts to understand how and why it works is well on his way to gaining the know-how to exploit the full capabilities of his command. Perhaps this is why so much attention is placed upon the need for superior communications by top military leaders who emphasize the absolute necessity for the closest union between the commander and his control system.

# Tactical Operations Center

Lieutenant Colonel Malcolm M. Jameson, *Infantry*  
Faculty, Command and General Staff College

**C**OLONEL Shield, Chief of Staff, I Corps, briefly studied the faces of the small group of officers gathered in his office. Of the three, Colonel Search, the G2, was the senior; an infantryman, always enthusiastic, sometimes outspoken, but with an imaginative and fresh approach to any problem. Representing I Corps artillery was Colonel Trunnion, its executive officer. Dependable and experienced he had proved his worth in many command and staff assignments. The third officer of the group, Colonel Power, the Corps G3, was also an artilleryman. His organizational ability coupled with his quiet and tactful personality had contributed greatly to the smooth functioning of the I Corps staff. Colonel Shield spoke.

"Gentlemen, the corps has just participated in an important and intensive maneuver. On the whole the exercise was successful. We have proved that our organization and tactics can be adapted to meet the challenge of the atomic age. In my opinion, however, our most important task is just beginning. With the events of the past month still fresh in our minds, we should analyze each situation critically to see what we might have done better and how we can improve the efficiency of our operations in different areas.

"Today," Colonel Shield continued, "I've called this meeting to discuss an area of interest to each of you: fire support. The corps commander feels that there is room for improvement in this field, particularly in the control and coordination of atomic fires."

"In your draft After Action Reports each of you made some recommendations on the improvement of our organization for control of fire support. Because your suggestions represent widely divergent points of view, I called you together so that we could apply some collective thinking to the problem and perhaps agree on some sound recommendations. I have a great deal of confidence in your abilities and I want you to feel free to express your thoughts frankly."

The chief of staff leaned back in his chair. "First, let me summarize the recommendations each of you have submitted, then we can discuss them in detail. G2 wants much more emphasis put on atomic target acquisition and surveillance. Corps artillery has recommended that the fire support coordination center or FSCC be given a greater degree of responsibility and control of atomic weapons employment. G3, on the other hand," Colonel Shield paused and smiled at Colonel Trunnion, "wants to abolish your FSCC entirely."

The reaction was immediate. Colonel Trunnion leaped to his feet. "Abolish the FSCC! Power, how in the world will we coordinate our fires? Who will take over the FSCC functions? What about air support? How . . ." The artilleryman paused, disbelief apparent on his face.

"When we get around to discussing my proposal, Trunnion, I'd like you to hear my reasons, then you can tear it to bits if you like," Colonel Power said sooth-

ingly. "It's not so drastic a change as it sounds."

Colonel Shield held up a hand. "Before discussing the fate of the FSAC, I want G2 to explain his position," he said; "Search has a different philosophy bearing on the FSAC problem."

"Frankly, chief, I haven't considered the question of what agency we would use to control atomic fires," the G2 explained, "what impresses me is the effect of atomic weapons on our tactics. Properly placed, a relatively low-yield weapon can destroy the combat effectiveness of a battalion instantaneously, even though that battalion adopts all of the protective measures it can, consistent with its mission. In addition to the personnel casualties, much equipment will be wrecked and the communications and control organization disrupted or destroyed. It follows that several more weapons can do the same thing to several more battalions. Employment of atomic weapons now permits accomplishment almost instantly of what formerly would require days or even weeks of bloody fighting. For this reason I think that we should look at firepower and our organization and tactics in a new light.

#### Is Firepower Everything?

"Another consideration involving atomic weapons employment is the contamination problem," continued Colonel Search. "By using air bursts we can avoid the fallout contamination of large areas which would

"Very well, Search," said Colonel Shield, "granting that what you say is true, how does this affect fire support?"

The G2 smiled before replying. "As you know, colonel, I sometimes come up with some rather revolutionary ideas. I feel quite strongly that the advent of atomic weapons on the battlefield will cause some radical changes in the nature of ground warfare. In fact, I believe atomic weapons will soon dominate the battlefield and all of our actions will be based on their employment. In the past the maneuver of the ground gaining arms of the infantry and armor has been the predominant consideration on which the support roles of the other arms was based. In my opinion this should be reversed. Firepower—I don't call it fire support—is now all important."

Colonel Search rose from his chair as his enthusiasm mounted. "In many cases we won't have to maneuver to destroy the enemy. We can destroy him with fire alone. Why exploit an atomic attack when there is literally nothing left in the target area but a radiological hazard? Instead, our efforts should be aimed at locating targets which we can destroy with our atomic weapons. We should avoid close combat because we can achieve decisive results without it. Organized in highly mobile, lightly armed forces with superior communications, the infantry and armor of the future will be used primarily in a reconnaissance role to obtain intelligence

***Maneuvering forces and firepower must be capable of swift response to the will of the commander. Both are important, but in a given situation either may become predominant and dictate how the other will be used***

result from surface or underground bursts, but we cannot avoid the contamination induced in the soil under the burst by the shower of neutrons resulting from the chain reaction. Maneuvering in or around these hot spots is difficult particularly when a number of weapons are being used."

on targets which can be destroyed by atomic weapons."

As the G2 paused for breath, Colonel Power remarked drily. "Search, it seems to me you are building quite an empire. As I understand it, practically every one will be working for you."

"Oh, I think there'll still be room on the staff for G3," returned Colonel Search as he sat down, "but seriously, I think that atomic warfare will develop into a deadly game of hide and seek. The opposing forces will attempt to destroy each other with atomic weapons without getting involved in close combat. If both sides have sufficient weapons and a fire support system which can act quickly in response to the will of the commander, then victory will go to the side with the best intelligence system."

"I think you have a good point there, Search," said the chief of staff, "although I'm not quite ready to buy everything you've said. Colonel Trunnion, I noticed you shaking your head several times while G2 was talking. I gather that you don't agree with him."

#### Is Maneuver Still Dominant?

"You are absolutely right, Colonel Shield," replied the artilleryman, "I take violent exception to what my good friend Colonel Search has said. Granted that the atomic weapon is much more powerful than anything we have had heretofore, it is still, after all, just another weapon. While we can expect changes in tactics as a result of atomic weapons employment, I favor a more evolutionary approach.

"When gas warfare was introduced in

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World War I and when mass bombing techniques were perfected in World War II, many enthusiasts predicted that the nature of ground warfare would change radically. This did not occur.

"Essentially, atomic weapons can be used, as we have always used fire support, to further the accomplishment of the Army's mission. This mission is not only to seek out and destroy the enemy's land forces but also to take and hold critical land areas. Search's idea might work if we had large numbers of atomic weapons and could use them freely. But how would his army operate if weapons were limited in numbers, or, worse yet, we became involved in a small war in which both sides refrained from using atomic weapons? I think we must be able to fight either with or without atomic weapons.

"I will agree with G2 that we should do everything possible to improve our intelligence system so that we can locate and destroy targets quickly. I don't believe we have yet reached the stage where that should be the principal mission of the bulk of our forces."

"Very well, Trunnion," said the chief of staff, "let's get on to your proposal. As I understand it, you want the FSCC to have more authority and control over atomic weapons employment. What are your reasons?"

"In the first place, Colonel Shield," replied the artilleryman, "a number of the means of delivery of atomic weapons are field artillery pieces. In addition to the 280-mm gun, we now have an atomic capability with the 8-inch howitzer. Both of these cannons are corps artillery pieces as is the Honest John rocket. The Corporal guided missile battalion may sometimes be attached to corps artillery. If not, it is under control of field army and available to fire in support of the corps. Atomic weapons also can be delivered by aircraft or they can be prepositioned by the engineers. We have the air liaison officer or

ALO in the FSAC and when planning barrier or denial operations we also have the corps engineer represented. The FSAC is organized to coordinate and control non-atomic fires by all of these delivery means but its authority over atomic fires is somewhat limited."

Colonel Trunnion leaned forward as he continued. "At present, the artillery commander, as the fire support coordinator, is responsible for the operation of the FSAC. The FSAC is responsible for processing requests and analyzing targets for nonatomic fire support including air strikes. On the other hand G3 performs the target analysis for those targets to be hit with atomic weapons. We feel this split in responsibility for target analysis is not desirable and that the FSAC should be given the job."

"This question has been argued pro and con for some time," observed Colonel Search. "I would like to point out that there is also a split in responsibility for target intelligence. The FSAC is supposed to be the focal point for target intelligence for targets to be attacked with other than atomic weapons. G3, working with G2, is the focal point for intelligence on atomic weapon targets. The G2 section, of course, is the focal point for all intelligence since anything that contributes to giving us a better understanding of the enemy situation is of interest to G2. The net result, I feel, is too much duplication of effort. Too many focal points can result in a blurred picture."

"You are absolutely right, Search," said Colonel Trunnion, "that's another reason why the FSAC should take over G3's responsibilities for analysis of atomic weapon targets. We feel that firepower, regardless of its source, will be more effectively used if all the necessary planning is accomplished by one agency staffed and equipped to do that particular job. That about sums up our case for the FSAC. What is this outlandish proposal of yours, Power?"

### The Middle Road

Colonel Power smiled as he answered. "Colonel Trunnion, I want you to know that I agree wholeheartedly that the responsibility for target analysis should not be divided. My solution, however, is somewhat different. My ideas on atomic warfare fall somewhere in between those advanced by Search and yourself. Like you, I favor an evolutionary approach, and I agree that we must be able to fight a war with or without atomic weapons. On the other hand, the atomic weapon is not just another weapon, in my opinion. I feel its impact on ground operations is just beginning to be understood. First, let me lay the groundwork for my arguments with a few fundamentals with which I feel we can all agree."

Colonel Power rose as he continued. "*Warfare is the violent application of military power. It is essentially a series of actions and reactions. The action or reaction appropriate to the situation may be the maneuver of a force, the application of fire, or a combination of both.* As Search pointed out earlier, until the advent of atomic weapons, the maneuver of infantry and armor was the predominant consideration on which the support roles of the other arms have been based. I think maneuver, although still of great importance, is not necessarily the dominant consideration. Atomic weapons now can accomplish, in a short time, tasks otherwise infeasible or which could be accomplished only by prolonged and costly combat. While exploitation of atomic fires is desirable, the manner in which the exploitation is accomplished is not necessarily the same as before. Exploitation may take the form of exploitation by other fires or by maneuver against deeper objectives whose seizure will ensure the capture or destruction of remnants of the force subjected to atomic attack.

"The basic decision, then, for any target will be whether to use fire alone, ma-

neuver, or a combination of both. This must ultimately be further amplified as to the who, what, when, where, and how, but since this decision is a basic one, it should receive the direct attention of the commander and the general staff. Once the decision is made, the dominant consideration will be apparent. As appropriate, fires can be tailored to support the maneuver or the maneuver designed to exploit the effects of the fire.

"Our present concept of fire support co-ordination has been developed as the result of World War II experiences, particularly in amphibious and other complex operations. Under this concept G3 retains general staff responsibility for coordination of maneuver and fire support. The functional responsibility has been given the artillery officer as the fire support coordinator. He performs this function by means of the FSCC, an agency whose personnel are drawn from the general staff, the artillery headquarters, and supporting forces."

"What's wrong with that setup?" demanded Colonel Trunnion.

"As long as maneuver is the dominant consideration on which the employment of the entire force depends, the present system is workable although there are some disadvantages," Colonel Power explained. "For example, tables of organization and equipment do not specifically provide for an FSCC. To exist it must depend on other organizations to contribute personnel, equipment, and communications. From the personnel viewpoint this is especially a burden on the artillery. The fire support coordinator is the commander of a major unit, the force artillery. His command duties are such that he will rarely be personally available in the FSCC or even in the fire direction center (FDC) in his own headquarters. As a result the artillery executive or the S3 who have important functions in the artillery FDC must represent him in the FSCC.

"With regard to air support, in practice the ALO is often an advisor to the force artillery commander. I believe he should be more readily available to the force commander and staff for recommendations on aerial reconnaissance as well as air support. The bulk of the available air support frequently goes to those who request the most, not necessarily where it is needed the most. Safety precautions in connection with air strikes often halt or inhibit the maneuver of adjacent units which might otherwise have relieved the situation without the use of air support. This is not always apparent in the FSCC.

"Under the present system of fire support coordination there appears to be overlapping and duplication of responsibilities and functions. This is especially true in the fields of target intelligence and analysis. We have already discussed this to some extent. Is a target to be subjected to attack by maneuver, atomic weapons, other fires, or by any or all of these? Until that basic decision is made, three focal points exist for target intelligence and analysis. This appears contrary to reason."

"Power, I'm not ready to concede that your criticisms of the FSCC are justified," said Colonel Trunnion, "but even if they were, what would you use to replace it?"

#### Tear Down One Wall

The G3 replied, "Actually my proposal is to tear down a small wall; an organizational barrier, if you will. I will grant you it's not much of a barrier, but some definite advantages will be gained by removing it."

"There are two distinct requirements for coördination of fire and maneuver. One of these involves the conduct of current operations and the minute-to-minute decisions associated therewith. The other requirement is for planning future operations. Let me review our present organization. As you know, the personnel of the

operations branches of G2 and G3 work side by side in the G2-G3 operations tent. They are not particularly concerned with future plans or policies, rather they deal with the hour-to-hour and minute-to-minute changes in the tactical situation. When operations are underway and moving fast, this is the nerve center of the command post. This is the point where the commanding general is briefed on the latest developments and often where he makes important decisions which are then translated into orders and action by the operations teams. The other branches of the G2 and G3 sections are located nearby working on plans or projects for which they are responsible. There is, of course, a constant interchange of information and ideas between all branches of both sections.

"Also located near the G2-G3 operations tent is the FSCLC with its personnel. If the fire support coordinator himself is not there, corps artillery is usually represented by the executive officer, Colonel Trunnion, or the artillery S3. We also find the G3 air, the ALO, and when required for certain operations, the chemical officer or the engineer. When naval gunfire support is available we also have the naval gunfire liaison officer or NGLO in the FSCLC. I might point out that essentially the same setup is located in the headquarters of the divisions attached to the corps and that the corps FSCLC has communications with the division FSCLC's as well as with the joint operations center, JOC, and the army FSCLC, if one is established. To perform its functions the FSCLC at each level requires some communications, and drafting and clerical help since they are required to follow the tactical situation very closely."

Colonel Shield had been following the G3's explanation intently. He spoke. "I think I know what you are building up to, Power. As I see it, the basic hour-to-hour decisions are generated in the operations tent. There the maneuver plans are worked out in detail as well as the general plan

for fire support. On the other hand the FSCLC develops the fire support plans in detail and also follows the progress of the maneuver so that intelligent action can be taken on requests for air strikes and other fire support."

"That is correct, Colonel Shield," the G3 replied, "operations is the nerve center for maneuver, while the FSCLC is the nerve center for firepower. Yet each must always consider the problems of the other. If maneuver was always the dominant consideration, and firepower merely used to support it, the only objection to this organization would be that there is some duplication of effort. But if you admit that firepower, exemplified by atomic weapons, sometimes may dictate the deployment of forces and scheme of maneuver, then one nerve center would be better than two."

"I just thought of something that might amuse you, Power," interrupted Colonel Search. "I once heard of a schizophrenic prizefighter. One side of his personality controlled his footwork; another side controlled his punches. They say his ring career didn't last very long."

"I don't think we are in as bad a shape as all that, Search," the G3 answered with a laugh. "Thanks for the idea though. A squad leader wouldn't delegate control of his fires to his BAR man. He must control both the movement and the firepower of the squad to make it an effective unit. Getting back to our problem, however, I would like to tell you what I had in mind to replace the FSCLC."

"I have in mind one operations center which would be the tactical nerve center for the corps. Contributing to the operation of this center, but with general staff functions and responsibilities undisturbed, will be the G2, G3, artillery, and air. In addition, as required, the NGLO, chemical officer, engineer, or other special staff officers may participate in the same manner. The purpose is to bring the principal fire delivery means closer to the commander

and his operations staff and to eliminate time delay and duplication of effort. Fire and maneuver must be coordinated after the basic decision is reached as to which will be the dominant factor."

"I wish you would go into a little more detail as to who would be in this operations center and how it would function," said Colonel Trunnion.

"Gladly," said Colonel Power. "First of all, I believe we should relieve the artillery commander of his fire support coordination function. As artillery officer and commander of the force artillery he will still remain an important advisor to the commander on fire support. At division and corps levels we would have the artillery furnish a senior liaison officer to the force headquarters whose function is to advise the commander and his staff on employment of the artillery including atomic delivery units.

"The artillery liaison officer will assist G3 in preparation of the artillery portions of operation plans and orders and the fire support plan. He will maintain close contact with G2 and the target intelligence picture. He will keep his own headquarters informed of plans and developments at the force level. The naval gunfire and air liaison officers will operate in a similar fashion. They will coordinate with the artillery, not necessarily *through* the artillery. In this tactical operations center the question of target analysis responsibility becomes immaterial, since there are no artificial barriers of organization. The important fact is that all concerned may contribute directly in arriving at how the forces available should be employed.

#### No Special Channels

"It's not my intention to disturb the normal support and fire direction functions of the artillery. Direct support, general support, and reinforcing fires of the artillery which are in consonance with the fire support plan in effect will continue to be delivered as before. However, FSCC

channels of communications as such will cease to exist. Requests for atomic fires, air support, or artillery fires which require fire support plan revision should be referred as appropriate to the G3, ALO, or artillery liaison officer in the tactical operations center. The request may be feasible but is it the thing to do? This question should be determined at the general staff level considering the situation and needs of the force as a whole. This ensures that fires go where they are needed the most and not to the subordinate who asks for the most."

"I have a suggestion on the target intelligence problem," offered Colonel Search. "With very little expansion, if any, the G2 section can set up target map facilities which would satisfy the needs of all concerned. In addition, we would have photo-interpreters available nearby if they are needed."

"Search is talking about expanding his section again," remarked the chief of staff. "What increase in personnel do you estimate would be required to run this operations center?"

Colonel Power smiled. "I thought you would ask that, sir," he said, "according to my calculations we can do it with less personnel than with our present setup of having a separate FSCC. Actually, the physical layout of the command post will not be altered materially, but manpower savings will result from the use of pooled facilities and reduced communications requirements. The only possible increase in personnel requirements that I can foresee would be the officer in charge of the operations center."

"You surprise me, Power," commented Colonel Trunnion, "I assumed you would take charge yourself."

"I must admit I considered it," answered the G3, "and I do intend to be available in the operations center when things are popping. However, G3 has a number of staff functions to perform which have to do

with long-range plans, training, organization, and the like. And I still want to be able to get off and think. Further, and I'm sure Colonel Search will agree, I don't think the personnel of one general staff section should work permanently under the control of another. I believe the operations center rates the full-time supervision of a senior officer with sufficient authority to make the little decisions and enough background to make sound recommendations to the general on the big decisions. Here at corps the deputy chief of staff should do the job. At division level there is no deputy, and one should be provided."

"That is an interesting proposal, Colonel Power," Colonel Shield paused and looked at the others. "Any comments, gentlemen?"

Colonel Search was the first to answer: "There are quite a few details which will have to be worked out, of course, but I believe that this is a step in the right direction. How about you, Trunnon, don't you think it deserves a trial?"

"I believe it certainly warrants further study," said Colonel Trunnon after some hesitation. "In my opinion the FSCC performs a needed function today, and I still feel the FSCC is capable of taking over more of the responsibility for atomic weapons employment than it is now assigned. However, to give credit where credit is due, I think Power is trying to raise the importance of firepower in the eyes of the commander and general staff; to bring it

closer to their considerations and decisions. If the operations center will accomplish that, it will be well worth trying."

Colonel Shield made a few more notes on the pad in front of him. "Gentlemen," he said, "we have agreed that the proposed operations center deserves further study and development. G3, put your proposal in writing and have it staffed. Don't neglect G1 in your coordination; after all, interior management is part of his responsibility.

"To summarize the results of this meeting I have jotted down some general conclusions that were brought out in our discussion," the chief of staff continued. "*The tremendous capabilities of atomic firepower require a reassessment of the basic relationship of fire and maneuver. Both are important, but in a given situation one or the other will be of predominant importance and may, therefore, dictate how the other will be used.* In an atomic war the situation will change rapidly as opposing forces seek to destroy each other while avoiding destruction from the other's atomic weapons. *Maneuvering forces and firepower must both be capable of swift response to the will of the commander. Organizational barriers which tend to compartmentalize these basic means of applying military power must be eliminated.*"

Colonel Shield stood up. "I might add that the success of any course of action—whether it involves fire, maneuver, or both—depends to a great extent on the accuracy and timeliness of intelligence. That's all, gentlemen."

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## AUTHORS

Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

# COMBAT INTELLIGENCE AND COUNTERINTELLIGENCE

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**T**HE tactical employment of atomic weapons is directly dependent upon successful combat intelligence efforts and effective counterintelligence measures. The intelligence system which will accomplish this is not something new and totally different from that used in the past. Indeed, there is no requirement for a new system, for the intelligence effort necessary for the effectual use of tactical atomic weapons differs from that required for conventional weapons in degree only.

From an *intelligence* viewpoint the tactical employment of atomic weapons involves first, the location and identification of targets, and second, an evaluation of the suitability of the target for atomic attack. The principal element that must be added to today's intelligence effort to make it appropriate for tactical atomic war is *speed*: speed in locating and identifying targets; speed in communicating information concerning the target to the place where the information can be evaluated; speed in the evaluation process itself; and speed in disseminating the resulting intelligence to the users.

From a *counterintelligence* viewpoint the principal element that must be added is *thoroughness*. Counterintelligence measures must be initiated and enforced at the lowest level of command as well as at the highest. They must be practiced by the individual soldier as well as by personnel

of Counter Intelligence Corps units. The measures must be designed to prevent the enemy from locating suitable targets for atomic weapon attack; and must ensure the effectiveness of friendly atomic weapons employment.

Even though the over-all intelligence effort for atomic war differs in degree only from that required for nonatomic war, the differences are significant unless commanders and intelligence personnel are forewarned and aware of them. This article discusses several aspects of the intelligence and counterintelligence requirements posed by atomic war. Although only one particular aspect of counterintelligence is discussed in any detail, it will be understood that there are counterintelligence implications in much that is covered from the intelligence point of view. For example, if friendly forces need certain types of information to employ atomic weapons, then logically enemy forces need the same types of information. Counterintelligence measures should be instituted to prevent the enemy from obtaining this information.

## Types of Information Required

The intelligence system used in an atomic war must locate and sufficiently identify a target to permit an evaluation of the importance of the target prior to the decision as to whether an atomic

weapon should be employed. The cost, the delay in getting the weapon on the target, and the enormity of damage that results, plus the fact that the use of the weapon may deny the target area to friendly forces for an appreciable time, all combine to place a high premium on the efficacy of the collection effort.

G2 must produce intelligence on the *size, shape, composition, concentration, vulnerability, recuperability, permanence, and criticality* of targets before an evaluation of appropriateness for atomic attack can be made.

*Size*—the target must be large enough to justify the use of a weapon.

*Shape*—a long narrow target may not warrant the expenditure of a weapon.

*Composition*—although personnel may constitute a proper target, material and equipment alone usually will not be destroyed unless in close proximity to ground zero.

*Concentration*—the greater the density of troops in the area covered by the burst, the greater the damage.

*Vulnerability*—a target is more vulnerable when personnel in the target are exposed to the maximum extent to the effects of atomic weapons.

*Recuperability*—troops with high morale and well-trained in defense against atomic weapon attacks may recover so

the friendly commander's mission to establish priority of attack.

If an atomic weapon is to be employed with maximum effectiveness, specific enemy troop disposition, to include strength and location, should be known. If specifics cannot be determined, the unit designation, that is, "such and such" regiment or battalion, may suffice, since from this knowledge a reasonable assumption regarding approximate strength and area covered by the target can be made.

#### Type of Unit Important

The kind of enemy troop unit concerned is extremely important because different types of units may require a different type of burst. For example, troops in the open will usually require a different height of burst than troops in armored vehicles. When various kinds of troop units are integrated into a combat formation, the optimum burst normally will be determined by the disposition of the various type units within the formation.

G2 must have knowledge of the amount and kind of natural and artificial cover in the target area as well as information as to the habits and routine of the enemy. Those considerations play an important role in the selection of the weapon, the location of desired ground zero, and the height of burst.

The state of training of enemy person-

*The tactical use of atomic weapons places a great responsibility on the intelligence system. Rapid production of combat intelligence and effective counterintelligence will be most essential to victory in the future*

rapidly as to preclude maximum exploitation of the attack.

*Permanence*—a temporary or fleeting target may disappear before the weapon can be employed against it.

*Critically*—when a shortage of weapons exists, the relative importance of targets must be evaluated in terms of

nel is another important consideration. Well-trained troops, with high morale, will recover more rapidly from atomic attack than will poorly trained troops. If the enemy unit has been thoroughly indoctrinated and trained in defense against atomic attack, it constitutes a much "harder" target, one which will be more

difficult to exploit, than a unit relatively untrained in defense against atomic attack.

Collecting agencies must provide information of possible enemy countermeasures against attack by atomic weapons. These countermeasures may vary from elaborate electronic devices to jam or counter the guidance or fusing systems of the weapon in flight, to simpler devices or equipment such as protective clothing, protective ointments, gas masks, and foxhole covers, to name only a few.

#### Need Terrain Details

A great deal more must be known about the terrain in the target area than heretofore has been required. The information needed concerns aspects of terrain which may limit or influence weapon effects. Included are such items as target altitude, topography of the target area, amount of ground cover, location and size of bodies of water and built-up areas, radical variations in elevation in the target area, surface reflectivity, and type and moisture content of the soil. Although a great deal of this information can be obtained from reference works usually available in higher headquarters, G2 must make sure that

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the terrain information available to him is up-to-date and accurate.

G2 also needs accurate information of the weather in the target area. Included are such items as temperature, visibility, precipitation, wind direction and velocity, humidity, and cloud cover. Weather information of this kind is usually available through friendly sources (artillery meteorological units and Air Force Air Weather Service units) and the collection of this information should not constitute a problem.

Periodically, G2 must use his collecting agencies to determine the effectiveness of the enemy's intelligence system. This effort is directed at determining what collecting agencies and sources the enemy uses, the type targets the enemy considers profitable, and the time that is required to put a weapon on a target, after receipt of information that a target exists, for each method of delivery. From an analysis and evaluation of this information, G2 determines what enemy collecting agencies he must particularly guard against and the broad principles of the enemy's employment of atomic weapons.

#### Target Acquisition

Atomic weapons offer for the first time an available means for attacking large area targets, including those in enemy rear areas such as training, bivouac, assembly, and reserve areas. Tactical airfields, logistical installations, and communications centers, which because of their distance from the frontlines up to now have been relatively immune from all but sporadic air raids, can be decisively attacked in a short time with a minimum expenditure of force.

No unusual or exacting requirements for accuracy of information have been introduced as a result of atomic war. In fact, accuracy of information need not be of such high degree since the area of damage that results from even a single

weapon is so great. It is no longer necessary for the pinpoint accuracy that was required for an artillery concentration. The primary requirement now is for collecting agencies to establish that the total number of enemy troops in the target area justifies the use of the weapon, and to locate the center of mass of the target.

Little evidence exists to justify the hope that there will be any radically new ways of obtaining target information in the near future. Ground agencies such as line crossers, POW's and deserters, civilian refugees, patrols and reconnaissance units; air agencies such as visual and photo reconnaissance; message interception and radio direction-finding equipment appear to be the best sources of information available for some time to come.

Organic army collecting efforts in the past have been successful only to a depth of about 10,000-20,000 yards from the friendly main line of resistance, and then only in a stable or quasi-stable situation. It is easy to see that past procedures which have been too slow and too inefficient to produce reliable intelligence at depths greater than five to 10 miles from the line of contact probably will not be adequate to determine the existence of even *large* targets of opportunity in enemy rear areas in time for atomic attack.

Better trained personnel in collecting agencies and the use of faster means of communicating target information will help solve the very real dilemma occasioned by lack of new ways to obtain information. For deeper targets, aerial photography at very large scales (1:2,000 or 1:1,500), which can be developed on the inbound flight and air-dropped at the requesting echelon, will help provide the needed information.

#### Don't Wait—Predict

Two infrequently used techniques for locating and identifying targets must be used more often by intelligence officers. One technique involves analyzing the en-

emy, the terrain in which he is operating, his capabilities, and his doctrine. From a study of these factors, G2 can foresee the location of potential target areas and direct his collecting effort toward surveillance of these areas.

The other technique might be termed the "induced target" method. During a battle or a campaign it is not unusual for the friendly force to take actions which make reactions by the enemy predictable. The G2 who has a knowledge of the enemy's past battles and who has studied the enemy's tactical doctrine should be able to predict, with a high probability of success, the relative probability of adoption of future enemy courses of action. Forearmed with a knowledge of the identification of the enemy force, and the probable location of the target, the G2 can reduce the time for the collection and evaluation effort to the minimum.

It is evident that the saving in time of locating and identifying targets by use of these two techniques is considerable over that required for what has been the usual procedure. In the usual procedure a report of a target triggers the collecting effort for the information necessary to verify and evaluate the reported target. This procedure is time-consuming, surrenders the initiative to the enemy, and is inadequate for atomic war.

One word of caution, however, is in order regarding these two techniques. They should only be used by trained intelligence officers who understand the enemy capability doctrine. Attempting to "guess" what the enemy will do, or to predict his probable intentions, is foolhardy and usually will lead to disaster.

Compounding the difficulty of acquiring targets is the fact that no target can stay concentrated in one place for long and live on the atomic battlefield. The enemy will disperse his forces and depend upon a high degree of mobility to permit a concentration at a time and place of his choos-

ing. The period of concentration undoubtedly will be as short as the enemy can make it, and every means at his disposal will be used to confuse and deceive friendly forces that a target exists. This set of conditions makes it imperative that the utmost speed be achieved in locating "genuine" targets, and in producing sufficient intelligence of them to permit the employment of atomic weapons at the proper time and place.

#### Processing Time

If intelligence is to be produced in time to be of value to the commander, speed is essential. The rapid production of intelligence always has been desirable; in atomic war it becomes all-important.

Many of the factors or elements which make up the intelligence effort have not changed as a consequence of the introduction of atomic weapons to the battlefield. An example is the almost complete dependence upon the age-old collecting agencies to produce information of enemy targets initially. Thus if speed is to be added to the intelligence effort, it apparently cannot be introduced until after the target information is obtained.

It would be difficult to introduce speed into the processing effort, if such effort had in the past been accomplished with facility and dispatch. However, such is not the case. A recent study showed that the average delay time for messages passed from one echelon to another almost doubles with each successive echelon. Another study indicated that over one-quarter of the time consumed by a radio or telephone message is taken up with words concerned solely with identification procedures and message handling. From these two examples alone, it is easy to see that often the time consumed in processing information into usable intelligence far exceeds the time required to collect the information.

Obviously, then, this is an area in which a great deal of improvement can be made

—improvements which will speed up the intelligence effort so that it will be adequate to support the tactical employment of atomic weapons.

The basic requirement is to have only highly trained and competent personnel in the intelligence organization. The best processes and procedures and the best technical devices to assist in processing information are utterly useless in the hands of untrained personnel. In a war in which it is visualized that speed of processing information is of the utmost urgency, thoroughly trained and dedicated personnel are a necessity.

#### Direct Channel Necessary

Probably the next most important requirement is an improved communications system which will permit the S2 of a battalion or a regiment to use a telephone or a voice radio and speak directly to his regimental S2 or division G2. The grid line communications system is a step in the right direction, but does not go far enough. What is needed is a *direct channel* for intelligence use from battalion S2 to regimental S2 to division G2 to corps G2, and direct service from each of these echelons to the corresponding adjacent units. Only after "hot line" communication service is provided will the intelligence system be able to function with the speed it must have in an atomic war.

Also needed is a standard message form which will require the writer to fill in certain blanks, thus providing all the details of enemy activity that have been observed or reported. All too often, long processing delays are encountered when it becomes necessary to call back to obtain additional information which should have been included in the original message.

Still another requirement appears to be the designation of a single tactical echelon as the point where atomic target information from all collecting agencies, including technical surveillance systems, is in-

tegrated, correlated, and processed. The necessity for the designation of one headquarters to accomplish this function is obvious when one considers that many collecting agencies do not provide complete information, and that many technical surveillance devices will be airborne, will operate over wide areas, and cannot be restricted to small unit boundaries.

### Make Corps Focal Point

Since a corps conducts operations over a wide front, has available information from its division's collecting agencies as well as its own, and at present is the lowest echelon which controls the delivery means for atomic weapons, it would appear that it is the logical headquarters to perform this detailed processing so that intelligence would be of immediate use to tactical commanders. This is not to say that information need not be processed at headquarters below corps. On the contrary, if corps is not to be bogged down with unimportant and inaccurate information, processing at lower headquarters must be thorough and complete. It does mean, however, that information from smaller unit collecting agencies that would require an inordinately long time to evaluate should promptly be transmitted to higher echelons with the accompanying notation that it is unevaluated information.

Finally, many of the mechanical devices such as teletypewriters and roto-files, which large business corporations use daily in their efforts to reduce costs and save time and personnel, can be put to good use in processing information. Think how much time and effort would be saved if a battalion S2, instead of telephoning information to regiment, could put the same information on a teletypewriter and know that as the message was being typed, it was being received, not only at regiment but at division and corps as well. Consider also the great saving in time that would accrue if these teletypewriters produced a

concise message form with several carbon copies which merely had to be torn off the machine and distributed, instead of being laboriously copied.

These are but a few of the examples that might be mentioned. They are, however, sufficient to give ample evidence that even now there are technical devices which, if made available, would reduce the processing time for information to a fraction of that now required.

### Devices For Surveillance

Battlefield surveillance is defined as the all-weather surveillance, *by any technical means*, of the ground area extending several score miles into enemy territory from the main line of resistance. Associated with the term are those instruments, devices, processes, and procedures required to correlate and apply rapidly and effectively the information derived from this surveillance.

If instruments or devices are to satisfy the requirement for continuous all-weather surveillance of a battlefield several score miles in depth they must have either the capability of detecting at long ranges, or be short-range devices which can be transported by one means or another over the area to be covered. To be economically efficient, particularly for long-range surveillance, these instruments should be of two classes. First, there should be those which can scan or observe wide areas to discover the existence of targets. It is not necessary that these devices be able to define the targets. Radar and infrared devices are examples of this type. Second, there should be those instruments which, after a target has been located, can allow a detailed study of the target to be made. Television and photography are examples of this class.

A great deal of research and developmental work is in progress on instruments of this nature. It offers hope that eventually G2 may have real technical assistance

in his search for information of enemy targets. Some of the more promising of these devices, or techniques of their use, are discussed here with reference to the echelon of command at which it is visualized their use will be most appropriate.

#### Eyes For Regiment

At the regimental or battalion level, man-transportable radar will permit moving troops or vehicles to be detected, and sometimes located, under conditions of darkness, fog, or smoke. Passive infrared devices allow detection of vehicles, and occasionally personnel, under conditions of total darkness. Devices of this nature make it possible to monitor specific points at night, and are useful in giving advance warning of enemy attacks or raids. Television cameras, which can be erected or dismantled rapidly and mounted on commanding terrain or on high towers, permit detailed investigation of target areas without the viewer exposing himself. Infrared searchlights used in conjunction with infrared viewers allow visual observation of enemy activity at night without the enemy knowing that he is being observed, unless he is equipped with infrared detecting equipment.

At division level the newer surveillance capabilities are generally those which can be used in conjunction with light aircraft of the division. Television cameras mounted in light aircraft with receivers on the ground make it possible for a viewer to see what the pilot and observer in the aircraft see without depending on a verbal report. Television receivers in forward areas let frontline commanders obtain direct benefits from such techniques.

Light aircraftborne infrared equipment permits detection of enemy vehicles, enemy concentrations, and infrared searchlights at night. Airborne radar and infrared equipment allow rough determination of likely target areas. Aerial photos from division light aircraft give good detail and

a permanent record for accurate photo-interpretation of areas of interest developed from low resolution devices.

At corps practically the same sensory devices are available as at division except that the equipment can be bigger and more complex, and greater advantage can be taken of more advanced techniques. By using large airborne search radars, corps aircraft can observe moving targets such as tanks and vehicles deep in enemy territory, even though the aircraft carrying the radar remains over friendly territory.

#### Long Range For Army

Field army surveillance devices should have ranges of several score miles. To compensate for this extreme range, the surveillance capability does not need the detail that is required at corps and lower levels, nor does the element of timeliness play such an important role. The capability for long-range surveillance is now provided field army by high performance aircraft utilizing television, photography, infrared scanning, and visual observation. The fundamentals of the use of these sensory devices do not vary greatly from those that are available to division and corps. However, the use of large aircraft does permit even more complex and heavier equipment.

Radar and infrared scanners can be used to eliminate less profitable target areas. Once a likely target is located, aircraft using the newest and most modern cameras can obtain large-scale photographs of the target area for photointelligence purposes. This technique will result in a reduction in the number of photographic missions required to obtain target information. If the number of tactical air force photo missions is reduced, a considerable saving in the time required to produce photointelligence will result, since a greater proportion of the air reconnaissance effort will be expended on profitable targets.

### Reconnaissance Organization

Developments in modern weapons and the increased capability of destruction on a large scale, make it increasingly necessary for military forces to seek and maintain contact with the enemy, to penetrate his screening force and deceptive tactics, and to know at all times the location of his reserves.

Armored cavalry or mechanized reconnaissance units were originally developed to collect military information and to provide security for the unit to which they were assigned or attached. As faster and more mobile means of obtaining information were developed, the security mission was emphasized. Commanders tended to subordinate the reconnaissance and information collecting mission to the security mission.

Atomic war will, in all likelihood, be waged over extended distances by relatively small, mobile battle formations. These formations must have a built-in capability of providing their own local security if they are to exist. Hence the emphasis that has been placed on the security mission of reconnaissance units must be reduced. The tactical employment of these units must reflect their excellent capability of collecting information for intelligence purposes, as well as their capability for providing security.

Reconnaissance units will continue to have an important security role in future wars. However, this role need not be, nor should it be, the principal method of employment for such forces. They have an equally important role to play in the overall intelligence effort.

Intelligence of enemy rear areas will be a necessity in future wars. Reconnaissance units, with their good cross-country mobility, limited firepower, and excellent communications, can swiftly move deep into enemy territory, obtain and communicate information regarding potential targets, and then return to friendly lines.

Reconnaissance units can play a major role in carrying out significant portions of a deception plan. During periods of radio silence they can carry communications between major units. Deceptively, they have within their organic communications the ability to simulate the radio traffic of large armored units. They can erect dummy tanks, guns, and vehicles for air deception, and through counterreconnaissance can prevent detection by enemy forces. They can collect information for intelligence purposes and can deceive the enemy by placing false emphasis on their collection effort.

### Coordinate Air and Ground

They will be particularly valuable as a ground component of the air-ground reconnaissance effort. Air reconnaissance provides the fastest means presently available for obtaining information of the enemy in his rear areas. Yet in many areas of the world, weather conditions are such that the enemy can concentrate free from aerial observation for significant periods of time. Under adverse weather conditions, air and ground reconnaissance efforts must be so well coordinated that ground reconnaissance units can substitute for air reconnaissance.

The present-day mechanized reconnaissance units do not need major organizational or equipment changes to make them fully capable of performing either their reconnaissance or security missions in the future. What is needed, though, is an increased awareness on the part of commanders that this type unit is entirely capable, in fact designed, to collect information of the enemy. This information will not be produced, however, if reconnaissance units are fully occupied on security missions.

Recent developments in reconnaissance organizations have tested an extension of ground reconnaissance over enemy lines by the use of fixed-wing, or helicopter-

borne forces. The aircraft in the test units are simply the method of transportation used to move reconnaissance personnel to points deep in enemy territory. The method of operation after arrival at the air-landing point is limited only by the equipment and vehicles available, and the ability and imagination of the reconnaissance personnel and their commanders.

This type unit should operate at depths greater than 10 miles deep in enemy territory. The area from the line of contact to about 10 miles deep probably will be so heavily populated with enemy units that operations in this area will be extremely hazardous for air-transported units. Small unit ground reconnaissance and other local intelligence collecting agencies have been able to cover this close-in area successfully. At depths beyond 10 miles behind the enemy lines, the density of enemy troop population should be less and more localized, thus permitting full use of air-transported reconnaissance units.

Reconnaissance units of this special nature must have a clearly defined mission of collecting military information, with no accompanying mission of providing security for the force with which they are operating. With present-day aircraft and communications and surveillance equipment, these units can immeasurably improve the reconnaissance and target acquisition capabilities of divisions and corps. When longer range aircraft and communications equipment are available, such units should be able to provide information of the enemy throughout the field army's entire area of interest.

### Security

There are many different aspects of "security." However, for the purpose of this article the only aspect considered is the security which comes from a knowledge of the location and capabilities of the enemy.

The best security against atomic attack is the detection and destruction of the

source and delivery system of atomic weapons. Detection of the source will usually be accomplished by strategic intelligence, and normally will be only of incidental concern to combat intelligence. Detection of the delivery system, except possibly for very long-range weapons, however, will be the most essential requirement for agencies collecting combat intelligence.

Detection of delivery systems in time to permit their destruction before their weapons destroy friendly forces will be accomplished usually only by highly trained personnel of specialized collecting agencies. To increase their probability of success, these agencies must be equipped with the most modern and highly developed detection and surveillance available. They must have communications equipment that will permit them to relay their information directly to the headquarters that can act on the information. At these headquarters there must be trained intelligence officers who can evaluate and interpret the reports they receive.

The next best security against atomic attack is timely warning of an enemy attack. It is here that every soldier from the private up plays a vital role in the intelligence effort. Every man in our Armed Forces, if well-trained, is a collector of information. He must know the indications that point to enemy atomic attacks, and must know how to get information pertaining to these indications into the intelligence system. He must be so well-trained in this respect that every scrap of information, however seemingly unimportant, is reported immediately.

True, the specialized intelligence agencies will be expending every effort to obtain information of the enemy's atomic capability. Yet just as "big oaks from little acorns grow," the warning that will permit our forces to take simple but adequate protective measures against atomic attack may well be the result of the evalua-

tion of bits of information from many individual soldiers.

### Counterintelligence

Just as United States forces will be expending every effort to locate and identify targets for atomic attack, so will the enemy. Every means at his disposal will be used to discover targets for his atomic weapons. If the enemy is successful, the United States Army may not exist to fight another day. If he is not successful, effective *counterintelligence* will have materially assisted in defeating his efforts to obtain target information.

Counterintelligence is that aspect of military intelligence which deals with the neutralization or destruction of the enemy's intelligence system. In practice, it is accomplished by denial or deception operations, or measures, designed to prevent disclosure of information to the enemy or to deceive enemy intelligence agencies.

In the past the emphasis in counterintelligence has been on denial measures. Our troops are instructed in the importance of secrecy discipline from the beginning of their training. Camouflage and concealment are subjects taught early in basic training. The secure handling of classified documents is a matter that is emphasized daily. Under combat and simulated combat conditions troop movements are conducted under strict secrecy conditions. All of these measures, and there are many others, are for the sole purpose of hiding information from the enemy.

Another aspect of denial operations which has been emphasized are those active measures taken to physically block or hinder the enemy in his attempts to get information. Counterespionage, counter-subversion, and countersabotage are examples since they are more in the field of specialized intelligence, however, they are only mentioned here. Counterreconnaissance, on the other hand, is an active de-

nial measure in which our troop units receive a great deal of training and, as a result, are reasonably proficient.

### Must Emphasize Deception

In atomic war far greater emphasis must be placed on deception operations than has heretofore been the case. This is not to say that deceptive tactics have not been used, because they have. In World War II well-planned and elaborate deception operations were conducted. However, these operations usually were planned by higher headquarters and staged by large units only. Rarely has a small unit, such as a regiment or a battalion, conducted deception operations except as an integral part of the plan of some larger unit.

Deceptive tactics such as feints, demonstrations, ruses, construction of dummy positions, and the introduction of false information must become commonplace, everyday activities of the small battle formations that are visualized as the basic combat units of the future. Difficult though it may be, divisions, regiments, and even battalion-size formations must plan and execute deception operations designed to cause the enemy to waste his atomic weapons on targets which do not, in fact, exist.

What better way is there to deplete the enemy's stockpile of atomic weapons than to have him employ them willy-nilly on targets which exist only in the eyes of enemy intelligence agencies? Tactics such as these will not only result in wasted atomic weapons, but will, at the same time, make it far easier for friendly intelligence agencies to locate the enemy's atomic delivery means.

### Denial Still Important

Denial measures will be just as important in the future as they have been in the past for deceptive tactics cannot succeed unless denial measures are successful. Our troops must continue to be trained in

the use of camouflage and concealment and other measures which hide information from the enemy.

Training in deceptive tactics and techniques must be commenced early and training must be continuous. Every command post exercise and every maneuver should require the preparation of deception plans and the conduct of deception operations. A significant portion of the training at service schools should be devoted to preparing officers to plan and execute this type of operation. Only when this is done will our Army be prepared to fight and win an atomic war.

#### Summary and Conclusions

The tactical employment of atomic weapons has placed a heavy burden on the intelligence system. It is a burden which cannot be lightly regarded. Victory in war of the future will depend, in large part, on the rapid production of combat intelligence and on effective counterintelligence.

Research and development agencies are working day and night to improve and perfect technical devices which will assist in obtaining information of the enemy.

A strenuous effort is being made to reduce the time required to process and evaluate information into usable intelligence. New concepts in processing information are under study. Augmented communications systems are being tried out. Increased personnel authorizations for intelligence sections are being considered. New type manual display aids and files are being field tested.

The Army is experimenting with and testing new type tactical units designed to improve the information-gathering capability of today's forces. Each of these new units has certain advantages. However, there also are disadvantages which still must be overcome before the stamp of ap-

roval can be placed on the inclusion of these units in the troop basis.

The "intelligence community" is devoting considerable time and effort to publicizing the importance of intelligence in atomic war. Intelligence training in the field and in service schools is emphasized. Commanders are urged to exercise the same care in selecting intelligence officers they use in selecting operations officers.

From the above summarization, two facts stand out. First, every available means is being used in an effort to improve the present intelligence system. Second, there are no radically new and different methods immediately available for producing intelligence of enemy rear areas. Changes and improvements to the present system will be evolutionary, rather than revolutionary. In brief, there is no such thing as an atomic intelligence system.

Since no new intelligence system, as such, has been developed since the advent of the atomic age, will the intelligence effort be adequate to meet the challenge of atomic war? The answer to this question is, of course, a qualified "yes."

Existing intelligence organizations and methods under the direction and guidance of trained and competent personnel are capable of greater efficiency and better integration. With improvements in methodology and training, and with the addition from time to time of scientific devices to aid in the collection of information and its more rapid evaluation, they should be able to meet the intelligence requirements for the tactical employment of atomic weapons. The key is highly trained and competent personnel in the intelligence system who possess initiative, integrity, and curiosity. With them the intelligence effort will succeed, without them it may fail.

# MILITARY NOTES AROUND THE WORLD

## UNITED STATES

### **Atomic Aircraft Plans**

Two aircraft companies of the United States are under contract to develop an airframe for an atomic-powered airplane. One of the plants at which this development will take place is in Georgia near Dawsonville, the other is in Fort Worth, Texas. The nuclear powerplant for the atomic plane is under separate development. Engineers have stated that the atomic powerplant now in use in atomic-powered submarines is about 100 times too heavy for aircraft use. It is expected that one pound of uranium fuel will liberate as much energy as the burning of 1,700,000 gallons of gasoline.—News release.

### **Vessels Launched**

The third *Forrestal* class aircraft carrier, the *USS Ranger*, is now being readied for fleet service. Two carriers of this class, the *Forrestal* and the *Saratoga* (MILITARY REVIEW, Jul 1956, p 68), are already in service. The 181 million-dollar vessel is 1,046 feet long and when completed will include all the improvements built into her sister ships with major advances in weapons handling equipment. Other vessels recently launched include a destroyer escort, the *USS Van Vorhees*, and a 1,600-ton radar picket ship, the *USS Price*. The *Price* is one of 36 converted ships that are

expected to augment the fleet by next July and is equipped to detect, identify, and report air, surface, and subsurface craft.  
—News release.

### **Zero-Length Takeoff**

Air Force *F-84 Thunderjets* can now be launched from a truck-mounted platform. The launching platform used in this tech-



*F-84* in launcher takeoff.

nique is the same normally used in launching the *Matador* guided missile. In this type of takeoff, the plane's turbojet engines are opened up to full speed and a Jato booster bottle drives the plane to a 4g acceleration, making it immediately airborne. It is reported that the shock of the unconventional takeoff is less than pilots normally experience during catapult launchings.—News release.

### **Endurance Record**

In a test run to prove its reliability and stamina, a land-based duplicate of the atomic powerplant of the submarine *Nutilus* has operated continuously at full speed without refueling for more than nine weeks. As a further demonstration of the economy of this type of atomic steam-propulsion plant, it has been announced that the *Nutilus*, since it first put to sea in January 1955, has traveled nearly 50,000 miles without refueling.—News release.

### **Trailmarker**

An electronic trailmarker, successfully tested on Greenland's ice cap, utilizes wires laid on each side of the trail. Alternating current fed through the wires is detected by a receiver mounted in the vehicle using the route, and indicators in the vehicle give the driver his position within the trail. Warning devices sound if the vehicle crosses one of the wires. A simplified one-wire trail-marking system is also under test.—News release.

### **Missile Developments**

Some of the recent developments and improvements in the United States guided missile program include the following:



*Army's Honest John.*

The *Nike B* will be faster and have a longer range than the present *Nike*. It can carry an atomic warhead and is scheduled to be ready for action in less than

two years. It can be launched from the present *Nike* installations with minor modifications. *Nike* installations now surround 18 United States cities. The present mis-



*Ground-to-air Terrier.*

sile has a 25-mile range and a speed of 1,500 miles an hour.

The accuracy of the *Redstone*, the Army's largest surface-to-surface missile, has been described as "most remarkable." The *Redstone* which has a range of 300 to 500 miles is considered a developmental step toward the projected 1,500-mile *Jupiter*.

The *Jupiter*, which is being produced jointly by the Army as a ground-launched weapon and by the Navy for surface ship and submarine use, is an artillery type intermediate-range ballistic missile. A three million-dollar contract for engineering and production work on this missile has been announced. The Navy has started conversion work on two merchant type vessels for use in testing the *Jupiter*. These tests are expected to take place in 1958.

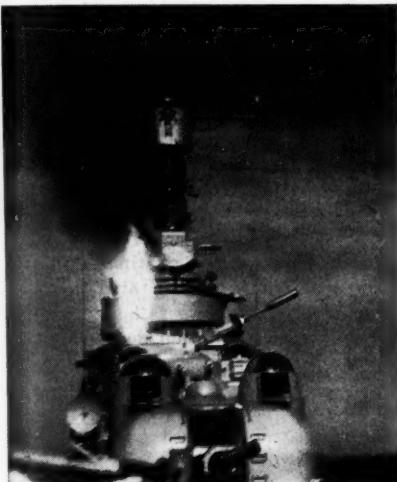
Rockets will eventually replace the conventional artillery in the *Pentana* five-sided division. These rockets are reported to be the *Lacrosse*, a needle-nose antitank weapon; the *Dart*, a short-range rocket for use against armor, pillboxes, and bunkers, which can be handled and fired by one soldier from a wheeled launcher; the *Redstone*; the *Jupiter*; the *Honest John*; and the *Corporal*.

The Navy's *Petrel*, an air-to-surface missile designed for use against enemy ships and submarines, is described as having an intricate electronic system which guides the missile to its target at high speed and with a high degree of reliability. Launched by patrol aircraft well outside the range of the target's air defense, the

fired without requiring the ship to turn and head for the submarine before taking offensive action. The 500-pound *Able* covers a larger ocean area more effectively than the old type depth charges and has a variable range. The launcher has a flash deflection shield which diverts the exhaust blast upwards, thus protecting the deck areas.

A launching site for rockets has been constructed near Fort Churchill on Hudson Bay, where eight rockets are scheduled for launching during the International Geophysical Year. A total of 52 rockets will be launched in 1957 from various United States-controlled locations in connection with this project.

Hawaiian sea areas will be used as a major guided missile training area by the Navy. The training facility for use of this range is located at Bonham Air Force Base, Kauai, Hawaii.—News release.



**Antisubmarine Weapon Able.**

*Petrel* is expected to reduce pilot losses from enemy antiaircraft action.

A 12 million-dollar contract has been announced for *Regulus II*, a bigger, faster, and longer-range development of an earlier model. The forerunner of the new missile, the *Regulus I*, is presently carried by four cruisers, two submarines, and four aircraft carriers.

In addition to the *Regulus* and the *Petrel*, the Navy's operational missiles include the *Terrier* surface-to-air missile, and the air-to-air *Sparrow*. The planes of Squadron 83 aboard the aircraft carrier *Intrepid* of the United States Sixth Fleet have been equipped with the *Sparrow*.

An antisubmarine weapon, designated *Weapon Able*, is a rapid-firing rocket fired from a launcher that can be trained and

#### 'Thunderchief'

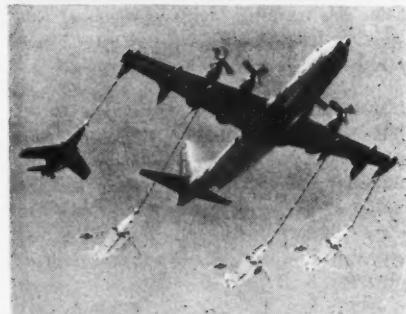
The latest in the line of "Thunder" aircraft, the *F-105 Thunderchief* is now in production. The *F-105*, a fighter-bomber capable of carrying nuclear weapons, exceeded the speed of sound on its first test flight and has been described as performing exceptionally well throughout its tests. The plane is characterized by short and very thin swept-back wings, and a long cylindrical fuselage. Its one-piece tail surface is set low on the fuselage with a ventral fin underneath to provide lateral stability.—News release.

#### Atomic Submarine Named

The Navy's *SSR(N)-586*, a nuclear-powered radar picket submarine now under construction, has been assigned the name of *Triton*. The *Triton*, the largest submarine ever built, will have a displacement of 5,450 tons and will be able to carry two atomic reactors. The atomic underwater craft is scheduled for a task force role.—News release.

### **Multiple Refueling**

Both the Navy and the Air Force have developed probe and drogue aerial refueling techniques. The Air Force has successfully refueled three *F-100 Super Sabres* simultaneously using a *K-50* aerial tanker,



Air Force and Navy refueling tests.

and the Navy *R3Y-2 Tradewind* has refueled four *F-9F-8* jet fighters in a recent test. The *R3Y-2* carries sufficient fuel to service eight fighter planes. The fuel is pumped from tanker to fighter at the rate of 250 gallons per minute, and the entire operation takes less than five minutes to complete.—News release.

### **Increased Air Production**

Production of the Air Force's *B-52 Stratofortress* is scheduled to be brought to 20 planes per month, and it is anticipated that 100 of the multijet eight million-dollar airplanes will be in service by the

end of the year. Peak production of the *B-52* is not expected to be reached before late 1957. A step-up in the production of the *KC-135* jet tanker (MILITARY REVIEW, Oct 1956, p 68) to a rate of 20 tankers per month will be made. Peak production of the big aerial tankers, which cost four million dollars each, will probably not be reached until 1959.—News release.

### **Atomic Progress**

The discovery of new principles which will make possible revolutionary developments in the design and construction of hydrogen bombs has been announced by the Atomic Energy Commission. Models of weapons based on these principles which have been tested include a "pocket-size" hydrogen bomb, and a multimegaton fusion weapon which demonstrated that the hazard from radioactive fallout could be drastically reduced without decreasing the weapon's force.—News release.

### **Gun Turret**

The single tail-mounted gun turret of the *B-52 Stratofortress* is equipped with both search and gunlaying radars. An automatic electronic computer in the turret calculates the pointing data for the four 50-caliber machineguns of the turret and automatically points them at an oncoming target. The single tail-turret is considered adequate since the 650-mile an hour speed of the heavy bomber makes all but a rear approach virtually impractical.—News release.

### **Braking Parachute**

The Navy's largest carrier-based bomber, the *A3D Skywarrior* (MILITARY REVIEW, Oct 1956, p 66), is now being equipped with a 24-foot diameter deceleration parachute to ensure safe landings on wet runways or in emergencies. The braking parachute is not intended for shipboard use. The system is designed for a normal touch-down speed of about 170 miles an hour,

and includes safety devices to prevent premature or accidental release of the chute, and to permit jettisoning of the chute in an emergency.—News release.

### Pilotless Planes

A recently developed remote-controlled helicopter will be able to perform a wide variety of military missions in which danger to operating personnel is involved. In addition to the elimination of personnel from hazardous operations, the pilotless helicopter will have a greater load capacity since safety devices and structural features necessary to provide safety for operating personnel in manned aircraft can be eliminated. A pilotless VTOL aircraft named the *Bat* is also undergoing experimentation. The *Bat* will be completely automatic in flight and can be controlled electronically from land or sea bases. The pilotless craft is designed for stowage aboard submarines and can be operated from the restricted area of small warships. —News release.

### Robot for Radioactive Areas

A machine has been developed to work in dangerously radioactive areas. The "electrohydraulic manipulator" has two pair of arms that can be operated from a distance by electrical remote control and a television hookup to facilitate the operation of the robot.—News release.

### Paper Shock Absorber

A paper honeycomb shock absorber is a recently developed high-velocity aerial drop system. The paper honeycomb is fastened to the bottom of the load of air-dropped supplies and absorbs the impact as it hits the ground. A small parachute ensures stability of the package during the drop. The cost of the new system is only about 22 percent of the conventional "slow-drop" method. Individual loads of greater than a ton have been successfully dropped by the new method.—News release.

### National Resources Conferences

National Resources Conferences, to be conducted by the United States Industrial College of the Armed Forces, are scheduled for 16 major United States cities during the next year. These conferences are intended to highlight the interdependence, cooperation, and coordination necessary between military and civilian members of the national defense team.—News release.

### Radar Yardstick

A recently developed surveying radar is said to be able to measure distances of up to 50 miles with extreme precision. The device which uses a small antenna mounted on a collapsible mast enables surveys to be made in bad weather or darkness, and is able to take measurements through foli-



Army's survey radar.

age. The jeep-portable, distance-measuring radar is planned for use in speedy survey for missile launchers and heavy artillery. The system utilizes two identical stations which function by bouncing a radar signal between them.—News release.

### Bomber Base Dispersal

The Strategic Air Command's dispersal plans call for the transfer of SAC units to 11 bases within the next two and one-half years. The units will consist of 1,500 to 2,000 officers and men when built up. Future homes for SAC bomber wings are: Dow, Maine; Beale and Mather, California; Clinton-Sherman, Oklahoma; Griffiss, New York; Minot and Grand Forks, North Dakota; Columbus, Mississippi; and Bergstrom, Sheppard, and Amarillo, Texas.—News release.

### Uranium Production

The United States is now the free world's leading uranium producer with an annual output of three million tons. This production is expected to be doubled in the near future. In 1948 the United States produced only about 70,000 tons.—News release.

### Rapid-Firing Gun

A rapid-firing 20-mm cannon, one of the first weapons specifically designed for present supersonic jet aircraft, is capable of firing at a rate of 8,000 rounds per minute. Nicknamed the *Vulcan*, the electrically operated weapon has six rotating barrels that fire in succession and is patterned after the hand-cranked *Gatling* gun of 1862. According to its designers the *Vulcan* is simple to operate and maintain and can be fieldstripped and reassembled in less than 30 minutes.—News release.

## AUSTRALIA

### Destroyer Test

The *HMAS Voyager*, first of three *Daring* class vessels, is currently undergoing sea trials, and is expected to be commissioned as a unit of the Australian Navy this year. Two other *Daring* class ships, the *Vampire* and the *Vendetta* are planned for completion next year. *Daring* class destroyers have a displacement of 3,500 tons, and are 390 feet long. They will each

carry six 4.5-inch guns, six 40-mm anti-aircraft guns, five 21-inch torpedo tubes, and the most modern antisubmarine detection equipment. The vessels carry a crew of about 300 men and are capable of 35-knots speed.—News release.

## JAPAN

### World's Largest Tanker

The 84,730-ton *Universe Leader*, the world's largest tanker, was launched recently at Kure in southern Japan. The 780-foot-long vessel has a depth of 55 feet and is too large to go through either the Suez or the Panama Canals. Another vessel of the same tonnage and two 87,200-ton tankers are planned for construction in the same shipyard where the *Universe Leader* was built.—News release.

## WEST GERMANY

### Plans for Armed Forces

West Germany plans to buy American equipment and to construct both airplanes and naval craft for her newly created armed forces. An advance payment of 190 million dollars on an estimated total purchase order for \$1,400,000,000 which involves aircraft, tanks, and artillery is said to have been agreed on in negotiations with United States manufacturers. This purchase is in addition to the estimated one billion dollars worth of tanks, artillery, armored vehicles, and warplanes which the United States will give to the West German Government free of charge. In the aircraft production field, the Dornier Company is producing low-speed reconnaissance planes, the Messerschmidt and Heinkel Companies will produce the French *Fouga Magister*, a two-place, light jet trainer, the Focke-Wulf and Blume Companies will manufacture Italian light *Piaggio-P* trainers, and the Alfred Krupp Company has received orders for French *Noratlas* transport planes. According to present plans, the West German Navy will reach its intended strength of 20,000 men in about

three years. At present the navy has some German-built torpedo boats transferred to it by the British, and six 500-ton German-built minesweepers. The navy is negotiating for 12 destroyers from the United States and seven frigates from Great Britain. Plans for construction include 3,000-ton destroyers and 300-ton submarines.—News release.

## FRANCE

### Tactical Support Plane

The *Fanceur X.116* has been selected for development as a tactical support aircraft for overseas service. The twin-engine, low-wing *Fanceur* is equipped with tricycle landing gear and is said to have considerable differential between maximum and minimum speeds. It is to be powered by *Turbomeca* turboprop engines.—News release.

### Versatile Design

France's *Vatour 4050* (MILITARY REVIEW, Mar 1956, p 71) is a versatile design which can be produced in a single-seat, ground-support version, a two-seat, all-weather fighter, a bomber, and as a reconnaissance plane. Scheduled for delivery to the French Air Force this year, the *4050* utilizes a unique bicycle type



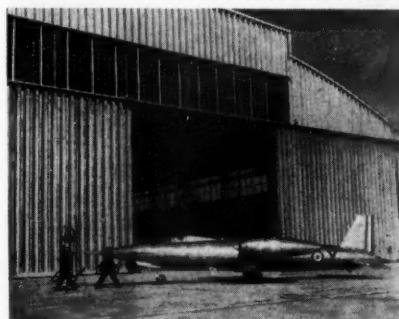
France's *Vatour 4050*.

landing gear and is capable of landing in less than 870 yards. Using its brake parachute, the landing run is even shorter. Powered by twin jets which may be equipped with afterburners and a reverse thrust device, the bomber version of this plane can make bombing runs with atomic

weapons at sonic speeds. The speedy bomber has an operational range of 1,500 miles, protective armor for all vital parts, and a pressure refueling system capable of filling all tanks in three minutes.—News release.

### Supersonic Test Plane

The *SO 9000 Trident*, powered by two *Viper* turbojet engines in the wingtips and a *SEPR 25* rocket motor in the rear fuselage, has a designed speed of Mach 1.6 for a duration of four and one-half minutes.



Rocket-powered *Trident*.

The plane has exceeded the speed of sound without using rocket power, and using only a fraction of its rocket power has exceeded Mach 1 in a climb. The needle-nose *Trident* utilizes short-span straight wings which are not fitted with ailerons. The "banking" of the rocket plane is controlled by the tail surfaces.—News release.

### Airplane Name Changes

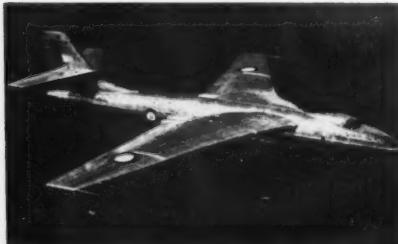
In a recent announcement, the names of several of the *Mystère* family of planes have been changed. The *Mystère XXII*, a twin-jet model powered by two *Turbomeca Gabizo* engines, is renamed *Etendard II* and is currently undergoing final tests. The *Mystère XXIV*, powered by a single-jet *Atar* engine, is redesignated the *Etemdard IV*. It is also in the final test stage. The *Mystère XXVI*, a NATO type light support plane equipped with a *Bristol*

*Orpheus* jet is renamed *Estandard VI*. It is now in an advanced stage of production.—News release.

## GREAT BRITAIN

### Heavy Bomber

The *Vickers Valiant*, Great Britain's first four-jet bomber, is powered by *Avon R.A. 14* axial flow, turbojet engines rated



**Vickers Valiant** and Jato installation. at 9,500-pounds thrust each without reheat. The swept-wing *Valiant B.1* is known to have averaged well over 500 miles an hour on a flight from London to Australia. The *B.2* version of this plane has a longer nose section and an eight-wheel landing

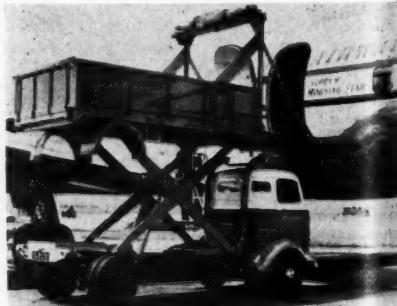
gear which is housed in fairings that extend beyond the trailing edge of the wing. The heavy *B.1*, which went into Royal Air Force squadron service last year, is equipped with jettisonable wing pods which house a *Super Sprite* liquid propellant rocket motor. Fueled with hydrogen peroxide, kerosene, and nitrogen, the *Super Sprite* is used in assisting the takeoff of the bomber. After the rocket fuel is exhausted the entire Jato unit is jettisoned and lowered to earth by parachute. The package includes automatically inflated air bags which absorb the landing shock of the recoverable unit.—News release.

### Nuclear Test Base

Tiny Christmas Island, 1,200 miles from Honolulu and 2,500 miles from the United States Pacific nuclear test base at Eniwetok, is reportedly under development as a British hydrogen bomb testing ground. Christmas Island officials estimate that 420 million dollars will be spent on the development the report said.—News release.

### Unloading Device

A British truck especially designed for loading and unloading air freight cargo was recently announced. The body of the



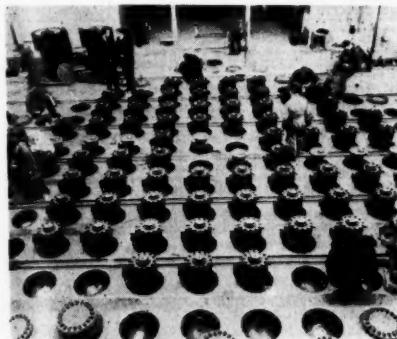
**Elevator truck.**

truck can be elevated to the level of the aircraft's hold by means of "scissor" cross members activated by hydraulic rams. The

front of the truck body folds out to provide a loading ramp capable of supporting more than a ton. The body can rise to a maximum height of 10 feet, four inches carrying a load of 6,720 pounds.—News release.

### Atomic Power Station

Great Britain's Calder Hall atomic power station will be in limited operation this year and is scheduled for full produc-



Calder Hall atomic pile.

tion early in 1957. When both atomic piles are in operation, the plant will provide 92,000 kilowatts of power for Great Britain's nationwide electrical system. This is the equivalent of the electrical power produced by a quarter of a million tons of coal. Plans for further development of atomic power include six stations, of which the Bristol and the Bradwell stations will have a capacity of 150,000 to 200,000 kilowatts. A second stage of the power program includes eight stations of 400,000-kilowatt capacity to be completed by 1965.—News release.

### Big Transport

The *Beverley* (MILITARY REVIEW, Jul 1955, p 69) is now in service with the Royal Air Force. The *Beverley*, designed especially for dropping heavy equipment by parachute, is powered by four 2,850-horsepower *Centaurus* engines and can

carry a 26-ton payload. Used as a troop transport, it can carry 94 soldiers or 70 paratroopers, and will accommodate 48 stretcher cases and 34 walking wounded when used as an air ambulance. It is equipped with heavy drop platform and release gear for individual loads up to 25,000 pounds. The 41-ton plane utilizes



Giant Beverley transport.

propellers 16½ feet in diameter and can operate from runways only 1,000 yards long.—News release.

### Tests Completed

The D.H. 110 (MILITARY REVIEW, May 1955, p 68, and Jun 1955, p 68) has successfully completed its naval trials at sea aboard the *HMS Ark Royal* (MILITARY REVIEW, Jan 1956, p 73). The tests included free and catapult takeoffs, handling assessment in the air and on the flight deck, and fully arrested landings. The all-weather D.H. 110 carries a crew of two, a complex radar and fire-control system, and is armed with four 30-mm guns and guided missiles.—News release.

## CANADA

### All-Weather Fighters

The *CF-100 Mk.4*, Canada's operational long-range, all-weather fighter, has achieved considerably increased firepower by the replacement of the conventional wingtip fuel tanks with rocket pods. The rocket-firing *Mk.4* is scheduled for service



**Long-range *CF-100 Mk.4*.**

with the Royal Canadian Air Force NATO units in Europe this year. The *Mk.4* is powered by two *Orenda Mk.11* turbojet engines of 7,000-pounds thrust each, has an operational range of over 1,150 miles, and was the first straight-wing combat aircraft to exceed the speed of sound. Canada's newest development in aircraft is the *CF-105*, a delta-wing, all-weather fighter. Performance data on this plane are not available since it is still in the prototype stage.—News release.

## USSR

### Air-To-Surface Missile

A new series of air-to-surface missiles, designed especially for use against shipping, has been developed in the USSR. The new family of rockets was developed in an electronics center near Moscow by a small group of German electronic experts according to a report. The missiles are designated *Comet 1, 2, 3, and 4*. Information available on the *Comet 4* indicates that it has a range of over 90 miles. For the

first 60 miles, it follows beam guidance from the launching aircraft. In the last portion of its flight, it is guided by radar echoes from the target. The radar signal is originated by the mother plane and is beamed at the target in constantly shifting frequencies to nullify the effects of jamming. Receivers in the missiles are tuned to shift with each change in frequency.—News release.

### Air Show

Seventy *Il-28* jet bombers took off for the USSR during a recent air show marking the withdrawal by the Soviets of an air division from Oranienburg, East Germany. The show featured Soviet troop-carrying helicopters and several flights of *MiG-17* fighters. One swept-wing, twin-jet *MiG-19* participated in the show, which is the first indication that this plane is in service in East Germany. The 2,000 airmen of the Oranienburg Division which departed for the USSR are part of a major withdrawal previously announced. More than 400,000 Soviet troops are estimated to remain in East Germany.—News release.

### Diamond Deposit

Diamond deposits at least as large as those in South Africa are claimed to have been discovered in Siberia. Prospecting of the deposit is continuing and industrial extraction will begin in the near future according to the report. The kimberlite—diamond bearing earth found mainly in South Africa—is said to be more than 3,000 feet deep.—News release.

### New Model 'MiG-17'

A revised version of the *MiG-17* is said to be powered by a new turbojet engine which develops 17,500 pounds of static thrust, including reheat. The new aircraft is scheduled for production in the Soviet Union and is believed to be in production in eastern Siberia.—News release.

# FOREIGN MILITARY DIGESTS

## Proposals for Reorganization

Extracted and digested by the MILITARY REVIEW from Report of the British Army Sub-Committee 1955 entitled "The Army in the Nuclear Age."

*This article presents the views of Captain Liddell Hart (British), General Westphal (German), and Colonel Sloan (United States) on reorganization of the army and was published as an appendix to the report from which it was extracted.—The Editor.*

### Captain Liddell Hart's Proposal

UNTIL shortly before the last war the British Army based itself on organization in "fours"—four sections in a platoon, four platoons in a company, four companies in a battalion, four battalions in a brigade. Although there were only three brigades in a division, the divisional artillery formed a fourth principal subunit. But with the multiplication of new supporting weapons, the number of men and vehicles tended to make the formation too cumbersome, while at the same time modern conditions, and the need for mobility, clearly demanded a more handy rather than a less handy size.

A solution of the problem was sought by reducing the number of subunits, and changing to the basis of organization in

"threes"—as Continental armies had already done. (The battalion, however, has remained an exception to this rule, maintaining four rifle companies. As it also includes a company which embodies the supporting weapons, it comprises five sub-units, four of which are independently maneuverable.)

A tactical drawback of organization in fours was, in practice, that it encouraged the average commander to operate "two by two," spreading his effort evenly, instead of maneuvering to develop a concentration of force at a vulnerable spot. It

*The British Army League is a group of eminent private citizens with political, military, and business experience. Its membership includes members of Parliament, officers of the armed services, and business executives. The report from which this article was extracted concerns itself with the changes in structure and organization of the British Army necessitated by the advent of nuclear and thermonuclear weapons into military consideration.*

fitted trench warfare, simplifying the process of reliefs and "leapfrogging" but was less suited to open fighting. By contrast, organization in "threes" fosters the idea of maneuver and concentration compelling the commander to distribute his strength unevenly. That is its chief advantage. Nevertheless, four subunits provide a skilled commander with more scope for effective concentration in attack and defense.

This is all the more important as warfare has become more mobile. But the need has not been met. On the contrary, the general reduction in the number of subdivisions reduced the organic flexibility of units and formations, thus diminishing their *power* to maneuver, that is, the powerfulness of any concentration of strength at a particular point.

We fought the last war with an army organized in "threes." Some of the consequences of this form of organization deserve to be noted.

In the 1944-45 advance from Normandy to the Rhine, Montgomery's headquarters controlled only two armies, which in turn had only two and three corps respectively and the corps operated only two or three divisions—sometimes, even, only one. The ratio of headquarters was no more economic in the American Army until a late stage. On top of both was Eisenhower's headquarters—reputedly comprising some 30,000 officers and men. The abundance of headquarters was one reason why the "advance to victory" was so protracted, despite mobile instruments and exhausted opponents. Montgomery himself was apt to quicken things up by taking shortcuts down the chain, but that sensible course emphasized the excessive abundance of the links.

The command setup in the Mediterranean had been even more overloaded. Thus for the invasion of Sicily there were three corps headquarters to handle a mere seven

divisions, with two army headquarters on top of them; Alexander's headquarters above these and Eisenhower's headquarters above that.

In Burma, at the start of the 1944 campaign, an even smaller force had two corps headquarters and above these successively an army headquarters, a land forces headquarters, and a supreme headquarters (the highest but one of these headquarters swelled to about 7,000 officers and men).

Nothing more cumbersome could be conceived than such absurdly long and narrow chains of command. They fettered mobility and flexibility at every turn.

Weighing these factors, the question arises whether the reduction from "fours" to "threes" was not a retrograde step. It might have been better to go forward—to "fives." Operating with five subunits would carry the same advantages as three in fostering the average commander's sense of maneuver, but would multiply those advantages. It would also embody the advantages of the four-unit organization, while extending them—since a "five-finger exercise" has even more flexibility and offers a greater range of combinations.

The idea that a commander cannot effectively control more than three or four sub-units has become a fetish. It is not difficult to find evidence from experience that such a limitation is unnecessarily narrow. In the 1918 "advance to victory" the British Commander in Chief, Haig, controlled five armies; while the Australian Corps under Monash, which played an outstanding role, handled five divisions throughout its advance, and at times as many as seven divisions. In the last war the Soviet "front commanders" frequently handled five or six armies, and their army commanders handled up to seven or eight divisions in some of their advances—without intermediary corps commanders.

It is not only in reduced speed and increased friction that we pay for additional links in the chain of command. The multiplication of headquarters swells the volume of the staff as a whole, draining the fighting units of far too many of their most capable personnel. The elimination of superfluous headquarters would go much further than mere combing toward a solution of this problem. It would release a large number of officers and other ranks for service with troops.

### The Army Corps

An army commander ought to be able to handle at least five divisions, and probably more, without having to deal with their commanders through an intermediate headquarters. The gain in time and personal touch would be marked. (An army commander has, in reality, a less complicated problem than that of the commander of a division, which comprises many variegated elements beside its principal sub-units. And a corps commander has so few in comparison that he and his headquarters are the least necessary link in the chain.)

If the number of divisions in any army exceeds five or six, it would be simpler for the commander to control a "wing" through a deputy than to interpose several corps commanders. Only if the total exceeds 10, or perhaps eight, would the advantages of having corps commanders tend to outweigh the drawbacks.

This would mean that corps would only need to be formed where armies were exceptionally large, and that in such a case the formation of corps would make it superfluous to form groups of armies, so dispensing with the need for any army group headquarters. Thus in any case one link in the present chain would be eliminated.

Significantly, the Soviets in the last war discarded the army corps except in the case of the armored forces, and there they

discarded the division—the armored corps commanders handling the brigades direct. Moreover, their armored corps were considerably smaller than those of other nations, so that they gained in handiness as well as in the quicker control due to the elimination of a link. As they had a far smaller proportion of mechanized and signal equipment than Western forces, it would seem evident that the degree of mobility they nonetheless attained under such a handicap owed much to the way they had simplified and shortened their chain of command.

### The Brigade

The elimination of the corps might be followed by the elimination of the brigade, and the reorganization of the division on a five-battalion basis. It would then be under the more immediate control of the divisional commander without any interposing brigade headquarters. By eliminating these, the "overheads" would be greatly reduced, both in quantity and cost. Still greater would be the gain in quickening the speed of operations. Similar advantages might accrue if the field artillery of the divisions were organized in a single regiment of five batteries.

With the change to a five-battalion division and the elimination of brigade commanders, it would be desirable to retain one of them as commander of the divisional infantry or, better still, as deputy to the divisional commander. The change would halve the number of brigadiers but give more chance of promotion because of the increased number of divisions and, consequently, of major generals' posts. The effect of the change should tend to raise the level of ability. The proportion of officers who are really fitted to command a modern brigade (which in practice so often becomes a group of all arms) is limited; and those who pass the test would benefit from increased opportunity for advancement.

### The Armored Division

The application of the proposed new basis to the armored division is even simpler than in the case of the infantry division, for the regrouping is comparatively slight. The present armored division falls into two distinct and heterogeneous parts—an armored brigade and a "motorized" infantry brigade. As the latter is carried in large, unprotected wheeled vehicles, its mode of transport emphasizes the incongruity of the combination. The divisional commander can but broadly direct his two brigades and has no real power of handling his armor in maneuver unless he "sits on top" of his armored brigade commander and takes things out of the latter's hands. It would be better if the armored units and the motorized infantry were organized in separate divisions of a smaller pattern.

The present armored brigade consists of five units—four tank "regiments" (as they are inaptly called in the British Army) and one motor battalion (of infantry) that can fight on foot. Thus it needs no radical alteration to turn it into a new pattern division, but merely the addition of the appropriate proportion of artillery, engineers, and services. It is worth consideration, however, whether a second motor battalion should be included. In any case this foot-fighting element should be "armored infantry" mounted in armored carriers so as to enable them to accompany the tanks and intervene more quickly to help them in overcoming defended obstacles.

On the other hand, the motorized infantry brigade would more suitably be turned into a motorized infantry division of the smaller pattern to back up the armored division. As it already consists of four battalions, that would require only a slight expansion of its basic component.

Three of the present armored divisions comprise 12 tank units, three motor units, and 12 motorized infantry units—a total of 27 units. That would suffice, with a

margin to spare, to form a group of three armored and two infantry divisions of the new and handier type—and it would have the further advantage of bringing an appreciable increase in the strength of the armored punch.

### General Westphal's Proposal

Captain Liddell Hart's proposals have received strong support from a number of French and German staff officers, among others from General Westphal who was chief of staff to Field Marshals Rommel, Kesselring, and Rundstedt in turn. In the winter of 1943-44 General Westphal made concrete proposals for the reorganization of infantry and armored divisions on similar lines. His proposed tables of establishment are shown on page 85.

### Colonel Sloan's Plan

A somewhat similar plan has been advanced by Colonel Sloan of the United States Army. Colonel Sloan argues that divisions can be streamlined and divisional overheads drastically cut. The field army of today contains more artillery battalions than infantry battalions, and approximately as many engineers as tank men. This concept has been outmoded by tactical atomic weapons. If the idea of relying on indirect fire high-explosive weapons is abandoned, he writes, and the principle of relying entirely on tactical atomic weapons for area saturation accepted, the number of divisions in the field army could be increased by half.

The new type division should be completely "air transportable," and this would involve the use of lighter tanks with the same mobility and firepower as the present medium tank. The basis of the division would be three or more tank-infantry regiments, an atomic weapons battalion, and a service support battalion, with a daily maintenance requirement of about 200 tons, or full loads of 20 aircraft capable of lifting 10 tons each.

<b>Infantry Division</b>		<i>Strength</i>
Infantry group: 1 leader, 5 riflemen	-----	= 6
Infantry platoon: 5 groups + headquarters (4 men)	-----	= 34
Infantry company: 5 platoons + company headquarters (15 men)	-----	= 185
Infantry battalion: 5 companies + battalion headquarters (50 men)	-----	= 975
Infantry of the division: 5 battalions each of 975 men	-----	= 4,875
Infantry leader of the division: headquarters + signal unit	-----	= 100
Artillery leader of the division: 5 batteries each of 6 guns + headquarters and signal unit	-----	= 1,000
Engineer battalion: headquarters signal unit, 3 companies	-----	= 650
Antitank battalion ( <i>Abteilung</i> ): as engineer battalion	-----	= 700
Antiaircraft battalion ( <i>Abteilung</i> ): organization in general as above	-----	= 650
Headquarters division + signal battalion	-----	= 650
Services behind the lines	-----	= 1,000
<b>Infantry Division Total</b>	-----	<b>= 10,825</b>

**Panzer Division**

Panzer brigade: 3 battalions ( <i>Abteilung</i> ) of 5 companies each + brigade headquarters	-----	= 3,500
Each platoon: 3 tanks, company of 5 platoons: 15 tanks + 3 tanks in company headquarters	-----	
Each battalion of 5 companies each of 18 tanks + 5 tanks in bat- talion headquarters = 95 tanks per battalion 3 battalions = 285 tanks + 15 tanks	-----	
Brigade headquarters, that is, total brigade = 300 tanks	-----	
Rifle brigade: headquarters + 3 battalions	-----	= 3,000
Artillery brigade: headquarters + signal unit + 6 batteries each of 6 guns = 36 guns	-----	= 1,150
Engineer battalion (inclusive ponton column)	-----	= 750
Antitank battalion ( <i>Abteilung</i> )	-----	= 650
Antiaircraft battalion ( <i>Abteilung</i> )	-----	= 650
Division headquarters + signal battalion	-----	= 800
Services behind the lines	-----	= 1,500
<b>Panzer Division Total</b>	-----	<b>= 12,000</b>

At least five divisions shall be organized under one army headquarters.  
Several armies shall be led by one army group headquarters.

Colonel Sloan's proposals are now being tested in practice by the United States Chiefs of Staff who are experimenting with various new streamlined types of organization not only of the division but of every unit and subunit.

### General

The proposals advanced by Captain Liddell Hart, General Westphal, and Colonel Sloan are presented primarily because of the opportunities they suggest for making economies in the use of manpower. The case, however, for placing more but smaller foundations under a single control is greatly strengthened by the growth of Soviet airpower, and still more by the advent of nuclear weapons. "We need," Captain Liddell Hart has written, "to grasp the principle of 'fluidity of force' in contrast to the old and obvious interpretation of 'concentration' and to develop a technique of 'controlled dispersion.' The embryo was contained in German practice during the later years of war.

"On the Russian front in 1944-45 the Germans often achieved an amazingly prolonged resistance, against such superior numbers, with armored divisions that were flexibly spread in small combat groups on a wide frontage—20 miles or more per division. The composition of such groups was usually a battalion of tanks, a battalion of mechanized infantry, and an equivalent artillery unit of self-propelled guns.

"On the Western Front, too, remarkable delaying and defensive power was produced by similar groups—which, in many cases, were even smaller. Often they were composed of a tank company, a mechanized infantry company, and a battery or two. The tiny scale of such groups was dictated not only by the scanty strength available

to cover the large front but by the better chance they had of evading the ubiquitous and overwhelmingly strong Allied air forces—and by their greater ability to penetrate between the Allied columns and deliver a quick counterthrust at the most effective moment.

"To distribute an armored division in such a flexible chain of smaller groups, each of them completely mobile, is essentially different from distributing armor piecemeal to support ordinary infantry—and free from the drawbacks of that practice.

"The present overlarge division would become a more 'operable' hand if divided into four or five major combat groups subdivided into a similar number of 'fingers,' or minor combat groups, capable of operating separately and practiced in doing so. They could at any moment be brought together to make a concentrated punch, if opportunity arises and air conditions permit.

"'Controlled dispersion' is basically different from distribution piecemeal. Little groups thus directed can have multiple effect while not offering concentrated targets to the air. A swarm of bees do not concentrate—they attack you from all directions simultaneously. That is 'multiple effect'—and should be our guiding idea in applying tactics of controlled dispersion.

"The aim of the new tactics must be to paralyze the enemy's action. The slogan of 'destroying him' in battle leads to self-exposure, self-pining, and the risk of being smashed. The domination of areas is going to count more than capturing or maintaining positions. We want a new principle of 'offensive fluidity of force'—to operate like the sea or a swarm of bees, not like a battering ram."

## The Evolution of Defensive Tactics

Extracted, translated, and digested by the MILITARY REVIEW from an article by Major General E. Wanty in "L'Armée-La Nation" (Belgium) January and February 1956.

FOR the last year or two the study of atomic weapons and their consequent effect on tactics and organization have been steadily increasing in both extensiveness and scope. Some of the conclusions of these studies have actually been tried out in a few full-scale maneuvers, but, in general, the matter has remained in the field of theory, rather than being brought to the stage of execution.

*So long as conclusions are not accorded a practical translation into facts, organization, and doctrine, armies will continue to be in a state of material and moral unpreparedness.*

In attempting to go too far in anticipation, however, there lies a definite danger of arriving at doctrine and organization that considers only the atomic aspect of war. Any studies made on this subject must consider all possible ways in which war might occur and, in addition to the atomic aspects, should certainly include conventional or nonatomic warfare as well as organized guerrilla activities. The latter most definitely has not been sufficiently considered.

The evolution of methods of offense has constantly tended toward an augmentation of the artillery preparation. The impact of atomic weapons on this trend, while not revolutionary, will surely result in an added emphasis on the preparatory fires and the exploitation of their effects.

From the defender's point of view appears the new danger of a rapid destruction of his installations and personnel with a reduced number of atomic weapons taking the place of the enormous amounts of conventional ammunition used in the past. This to be followed, of course, by the

irruption of armored forces into the breach thus created.

Long before the atomic era it was well known that a major advantage of the assailant lies in the initiative he possesses—the choice of time and place of attack. The length and heavy concentration of artillery preparation felt necessary in the past has often decreased the attacker's chance of achieving surprise. Today, a few atomic weapons, deliverable in an exceedingly short space of time, take the place of the long and costly conventional preparation, and surprise again becomes available to the attacking force. The possibility of surprise thus presents a real danger as soon as the assailant has established contact with his position.

A study limited to the defense of a position possesses the defect of being too static—entirely too static. To apply yesterday's defensive technique to present-day conditions would be to prepare for a lugubrious tomorrow. The comprehensive nature of battle must be recognized—it has become more desirable to wear down or to combat the aggressor at long range than to await him passively in prepared positions.

Lieutenant Colonel F. O. Miksche, in his "Tactics of Atomic Warfare," imagined the employment of atom bombs during the course of the events of May 1940. Let us, for a moment, do as he did. On 11 May the Belgians were in a very bad situation on the Albert Canal. The bridges had fallen intact into the enemy's hands; their armored divisions could fan out from them. But, instead of a few planes with their 100-pound bombs, we can count on limited atomic support. What would be the target? The canal bridges? They are much

too close to our lines. But we can halt the drive of the enemy's columns, cut off their gasoline supply, destroy the Maastricht crossings. And it is not necessary to score a bull's-eye to halt them and contaminate the approaches to the bridges for several hours.

Without a reaction such as this by atomic means, the assailant would easily be able to break through the defensive barrier, destroy the main part of one's operational forces, and deny his adversary the considerable amount of time necessary for bringing others into action.

It is impossible to dissociate ground tactics from its double context: strategy and grand tactics. The three must be superposed and coordinated into a coherent ensemble. Aviation will be more and more the only arm capable of an immediate effort—capable either of obtaining a decision in favor of the defender (an unlikely hypothesis), or of preventing a decision in favor of the aggressor. It is necessary, first of all, to survive victoriously in the phase of the strategic decision and, to that end, obtain a hold on all the life preservers possible, inclusive of atomic weapons. If we assume a position in the narrow field of defensive ground tactics only, we do it with the conviction that all things are interrelated and that even a perfect solution to this last problem would be of no value by itself alone.

#### Defensive Tactics

Some of the lessons of the last war condemned the continuous front, although Korea witnessed its reappearance. Any judgment of the suitability of the continuous front always must be subject to revision as dictated by circumstances. An examination of the total front that would have to be held to cover Western and Mediterranean Europe and the number of divisions immediately available to NATO, reveals the physical impossibility of maintaining such a front. Will we see the re-

appearance of stabilized and fortified fronts as Lieutenant Colonel Miksche believes? Or discontinuous fronts although still retaining their linearity? Or, again, "geographic bastions"—enormous, closed centers of resistance?

Before going to the heart of this problem, let us ask ourselves if the major, commonsense rules stemming from World War II under the blows of an air force which was absolute mistress of the skies, are still applicable in the atomic era.

The Italian artillery officer, Major Alberto Li Gobbi, in a study published by the *Rivista Militare* of July-August 1955, enumerates these rules as follows:

1. Air and ground explorations by day and by night, to increasing depth.
2. Constantly increased concealment, mimicry, and camouflage in a systematic attempt at tactical deception.
3. Automatic and instinctive dispersion.
4. The capability for rapid concentration for action at desired points and in desired directions.
5. Effective liaison.
6. Reduction of lost time between the location of an objective and action against it.
7. Moral preparation of the increasingly isolated combat.

In the defensive the necessity for presenting broader fronts and greater depths than in the past are the characteristics of "static dispersion." The disposition also must be suited for resisting an attack conducted only with conventional means, strong enough to require, on the part of the assailant, concentration of his artillery, infantry, and armored means into lucrative atomic targets. At the same time, the defender must avoid presenting "paying" atomic targets and must have at his disposal more fully equipped and more maneuverable reserves capable of all terrain movements.

All these are points that are hardly con-

tested any longer. They are, moreover, only an extrapolation of what was already conceded in the face of the aerial threat without the atom bomb.

### Center of Resistance

The present-day plans for occupation and defense of a position on a normal front are conceived, in different countries, in essentially the same manner. The "system" consists of an orderly arrangement of coordinated centers of resistance arranged in chessboard fashion or otherwise in two or three echelons separated from one another by a variable distance determined by the effective ranges of machine-guns, mortars, and antitank weapons.

The center of resistance corresponds, rather commonly, to an infantry battalion covering an area of 200 to 250 acres, and tactically and logically independent. It may be organized in several fashions—as a line, in chessboard fashion, even in angular sectors of company strength in conformity with the notion of all-around defense.

If we assume six miles of front and two miles of depth for the frontline infantry disposition as average figures, we obtain a figure of 12 square miles which represents approximately the total effective zone of a 20-kiloton type of atom bomb. To cover the same surface it would be necessary to fire from 8,000 to 10,000 classical projectiles. Again, there is no common measure between the effects of the two types of fire. The effects of 10,000 ordinary projectiles over the area of 12 square miles can be very moderate. On the other hand, the effects of the 20-kiloton atom bomb, deduced from the Hiroshima bomb, are total physical destruction up to 1,100 yards and light damage up to two miles.

If the ground zero of an atom bomb coincides with the center of a center of resistance of battalion strength, the battalion will be practically annihilated. It is very probable that, with the distances

and intervals now in vogue, two neighboring centers of resistance will be affected simultaneously and will suffer losses of 50 or 60 percent in an instant. And at this point we take issue radically with those who, coolly regarding these percentages, consider that the 50 or 40 percent remaining will suffice for reestablishing continuity of fire. The human factor is too often disregarded. Colonel Ardant du Picq propounded a striking comment: "The human being is able to endure but a given amount of terror in a given interval of time." At the beginning of the 20th century the English soldiers withheld from eight to 10 percent losses; in Manchuria the Russians 30 percent, and the Japanese 50 percent.

It is our belief that with 30 percent losses the combat ability of a unit will drop to zero, at least momentarily—but this at the critical moment of attack.

The risks of this must, therefore, be limited. Two different means of defense may be considered. Camouflage, which continues to be imperative—although with little chance of deceiving modern methods of detection—must include a "faking" of the terrain to attract the atom bombs to fictitious ground zeros calculated in such a way that the circles of the effects will not be tangential to the real centers of resistance. The second method is to increase the dimensions of the center of resistance and disperse its constituent elements more.

An enormous quantity of energy is wasted where the 20-kiloton atom bomb is dropped on terrain in which a few "useful" points are dispersed in the midst of broad, unoccupied zones. There is, however, a limit to dispersion beyond which it is dangerous to go.

Included in these limitations are the capacity of the soldier for independent action when isolated on the field of battle, and the capabilities of command.

Equipped with the automatic rifle, the soldier represents considerable firepower,

but he will always need the moral support of a friendly presence beside him. Traditional training continues to give most soldiers gregarious tendencies which make for useless losses. There must be a reaction in the opposite direction, but without going as far as complete isolation.

In the small unit the will of the leader is transmitted by direct contact, and unit *esprit* has free opportunity for manifesting itself. It seems impossible to disperse the men over a very extended area. The platoon covers a surface of 10 acres, and can hardly go beyond this limit since its orders are given either orally or by means of signals. In the company echelon, radio command facilities permit the exercise of command and the relative isolation of its constituent elements. The latter possesses sufficient firepower organically for creating, in spite of this dispersion, a coordinated system. If a company escapes the destructive effects of an atom bomb exploding in or on the center of resistance of its battalion, it will still suffice for holding the enemy in check for a certain length of time.

Up to the present time it has been rather generally assumed that the center of resistance should correspond to a battalion. However, by extending the concept in favorable terrain to the reinforced company, one could increase the number of centers of resistance and widen their intervals laterally and in depth. In this way we could considerably increase the area occupied by the battalion.

#### Firepower

In the present system the distances between successive echelons are determined by the effective ranges of all the orders of weapons. The employment of atom bombs, even in limited numbers, will annihilate certain "pieces" of the defensive chessboard, will open breaches in the fire system, and will produce an isolation of the centers of resistance that escape de-

struction. The classical solution would be the same as a reply to an attack by traditional means.

If the spaces separating adjacent centers of resistance are increased, it is possible that in certain cases they could not be covered entirely with the fire of flat-trajectory weapons. However, they would lend themselves to the fire maneuver of medium and heavy mortars, conventional artillery, and rocket weapons—even of tactical aviation.

#### Security Position

Designate it as we may, security position, outpost position, or cover zone, the strip of terrain economically held in advance of the position of resistance is as necessary as ever.

If the adversary has decided to resort to the use of atomic armament in this portion of the front, there is little probability that he will use it against this advanced portion of the field of battle since targets there are too dispersed and, individually, not particularly lucrative. He will most likely resort either to infiltration (especially by night) or an attack conducted with conventional weapons. The first method is to be opposed by a coordinated system of passive obstacles such as minefields and mobile and flexible surveillance. The second would be met by defensive tactics now in effect. On the battlefield of tomorrow every concentration of troops, tanks, artillery, and staffs will justify the employment of tactical atomic weapons. The term "concentration" is entirely relative.

We repeat, that the zone of 90 percent effectiveness can cover up to one and one-quarter miles of front and of depth with the zone of 25 percent effectiveness extending three miles in both directions. In areas such as these, if the assailant were led to dispose his troops in a conventional attack disposition, it would become possible to annihilate or neutralize his preparations.

It is of great importance, therefore, in addition to air observation—which is rendered uncertain due to the aggressor's air superiority—to have a coordinated system of observation comprising both optical and radar means, and of infantry-artillery liaison to reduce the dead time between the determination of a target and its attack with one's fire.

The advanced position should be variable in all its constituent parts; it should be constituted of observation and detection posts around which would gravitate mobile elements carefully trained in these very particular tactics, each night modifying their disposition and establishing ambuscades.

Progressively evacuated in the face of a powerful attack or in accordance with a preestablished plan, this advanced zone would become the zone of atomic harassment if the enemy ventured into it in strength. But it is probable that he will not run this risk. His own atomic means will possess such ranges that this relatively slight depth will make scarcely any difference.

Some military writers have expressed the thought that a no man's land of very considerable breadth might separate the two adversaries before the unleashing of the decisive atomic offensive. But it is no less logical—reasoning from the point of view of defense interests—to arrive at the curious conclusion that the defender must not abandon close contact with his enemy; for him it is a temporary safeguard.

The key to the situation is once again given us by the radius of the atomic effectiveness: one and one-half to two miles. The assailant must keep at security distance. Therefore, crowding close to him is tantamount to depriving him of his freedom of atomic action. Some writers believe that if the enemy's elements with which one is in contact began a withdrawal, one should follow them as closely

as possible so as not to break this contact—a security factor (entirely relative, however) at least for the elements on the edge of the position of resistance.

#### Main Defense Position

If the assailant decided to employ only atom bombs of the 20-kiloton type for his preparation, and if their ground-zero points were accurately placed with a zone of serious destruction of four square miles for each of them, a dozen atom bombs would suffice, theoretically, for knocking out all the strong points of a division sector of a six-mile front and a depth of five miles.

The disposition must be worked out on the assumption (already sufficiently critical) that the assailant will employ but a few atom bombs in the framework of a normal type operation for creating a partial break for expanding this maneuver.

Lieutenant Colonel Miksche has declared himself resolutely in favor of countering this by the methods of the old stabilized warfare: two echelons of moderate depth (about one mile) each separated by a terrain zone of four miles bristling with observation posts, shelters, and communication trenches and occupied by the ordinary supporting artillery. About two-thirds of the infantry will be in the first echelon. Back of the second echelon will be a deep zone of four miles followed by a third echelon of supporting points occupied by the armored units, the engineers, and the services with a depth of a mile—a total of 10 miles deep for a divisional front of six to 10 miles. The atomic artillery is in position in back of the second echelon.

The idea in back of this disposition is clear. An argument against it is certainly the small depth of each echelon and its consequent vulnerability. Assuming that six battalions are distributed over the six- to 10-mile front of one-mile depth it may be affirmed that two 20-kiloton atom bombs

dropped a mile and a half apart would create a frontal breach of two and one-half miles throughout the entire depth of the first echelon. The surviving elements would not be capable of recovering themselves before the attack by the assailant's mechanized forces. The solution of the fixed elements seems to be full of calculated, but uncompensated risks.

Here is another solution of Italian origin: four lines of centers of resistance or supporting points disposed over four to five miles of depth, with secondary centers of resistance of less than a battalion strength. Here, also, recourse is had to field fortifications, concealment, camouflage, and dummy positions. If, in the first scheme, vulnerability is great from the standpoint of breadth, it is in this case from that of depth.

Is there any possibility of a compromise between the two extremes? Is there a solution which, at the same time, will reduce the partial vulnerability of the men and lesser units without breaking the bonds of their cohesion and fire?

Both partial and over-all protection will be increased in the measure that each combatant or subunit is able to burrow into the ground, to find refuge there from the blast of the atom bomb, or each center of resistance is able to find cover for itself behind the terrain features.

#### Rough Terrain

All the data relative to the effects of the atom bomb come from tests made in flat terrain: Hiroshima, the solitudes of the Pacific, the desert at Los Alamos, and, probably also, the expanses of central Asia. Just what would the effects be in rough terrain? At first thought it would seem as if in a valley, there would be nothing to block the destructive radiations up and down its course—but what about the slopes? And would one find adequate protection on the far side of a ridge? Before attempting replies to these queries

that would provide us with approximate tactical solutions, it is necessary to pose a few questions.

We repeat, we are dealing with an unknown. The atom bomb, which is redoubtable with respect to personnel and matériel, whether shielded or not, does not seem to be able to modify the basic natural features of the terrain. Could we not assume, therefore, that these will constitute the "constants" of a defensive occupation? Is this something new? No. Topographic details—natural (or artificial) obstacles—in the past have played a major role in solidifying the strong points of the defense. But these small supporting points are of no value in the face of the atom bomb which can "snuff" them out. We must, therefore, resort to extrapolation, to an extension of the former data to a larger scale consistent, in all logicalness, with the advent of more powerful weapons.

In the interior of a defensive position there is an increase of distances and intervals but not a creation of great open spaces.

If terrain offers opportunities for partitioning, one's disposition may avoid linear regularity by successive echelons without, at the same time, assuming a staggered, checkerboard pattern. The centers of resistance will be adapted primarily to the geographic features—to the topographic lines. They will, perhaps, present an irregular figure, but we are under no compulsion to refrain from coordinating, under a single command, centers of resistance constituting an oblique or an inwardly curving line, for example. The defense of these centers of resistance must never be merely static.

Must we continue to fix in the minds of defenders the theoretical unrealistic idea of "resistance, in place, to the last man"? In actuality, these words possess only a vague and conventional meaning. Quite obviously, it is easier for a commander to

cover his responsibility by giving out this strict order at all times and in all places, than to express the mission in a more intelligent form. To continue this under the new conditions will be to condemn entire units to death and without gain. To the contrary, we must now look forward to maneuvers inside and outside of the centers of resistance; to total or partial evacuations and the reoccupation of centers of resistance which have not been hit or contaminated; to fire maneuvers; and to a rapid redisposition which will constitute a surprise to the assailant.

#### Divisional Reserves

Farther away, in the depth of the position, we have the divisional reserves. Mao Tse-tung wishes two units in the rear for each one on the front. The idea is an intriguing one, but can be considered only in the case of armies with enormous numbers of forces at their disposal. In our case the division needs the value of two infantry battalions, plus armored units and mobile engineer units in reserve. They will be employed—depending on the development of the battle—in counterattacks, in the stopping of breaches, or for obliging the assailant to concentrate classical means (infantry, tanks, artillery) for breaking this opposition and thus constituting targets warranting the use of the atomic weapons of the defense.

In their waiting disposition the reserves should be broken down to at least company strength, capable of rapid concentration, not by lateral movements but by movements converging toward the front. Taking into account the nature of the terrain, a distance of seven to 10 miles back of the first echelon and about four miles back of the second does not seem to be at all exaggerated.

The first mission of the supporting artillery will continue to be close cooperation with the infantry, more than ever rendered necessary by the increased iso-

lation of the centers of resistance. It will become more difficult, however, as a result of the widening of the fronts. The batteries will be more exposed to infiltration, which is always possible in too open a disposition, and to attacks from the rear.

The artillery is an arm which must ensure its own defense and, at the same time, serve as a safeguard to the infantry. If, as some advocate, the infantry battalion includes a battery of eight artillery pieces, this artillery would probably not participate in the concentrated fire maneuver—that is, the massing of fires. This latter seems to represent a grave risk, in actual fact. Concentration of fire by artillery means density of concentration in the terrain, for there is always the problem of siting weapons within range of probable targets. Now, perhaps more than any other type of concentration, the artillery is exposed to both atomic and normal air attack.

If the evolution proceeds logically, we shall find classical artillery largely dispersed frontally, enclosed in centers of resistance guaranteeing its units against partial attacks without pretense of playing the same role as the centers of resistance of the infantry, yet, at the same time, running the same atomic risks. This artillery would be employed mainly for blocking action and harassment in the zone of security and for the customary missions of direct support.

The 280-mm atomic cannon has a range of 18 miles. It is employed in sections but individual weapons could be used if needed, two guns covering the front of a division. Its rate of fire is six shots per hour, or 12 for this front, from which to produce two zones of 50 to 60 percent destruction. The isolated gun is able to produce the effects of a massive concentration of classical artillery, and nothing stands in the way, technically, of a convergence of the fire of several guns.

### Conclusions

These fundamental facts being known, the general plan of the disposition would be as follows:

A security zone of two to three miles depth in close contact with the enemy.

A first echelon of irregular course and depth, a complex of battalion or company strength centers of resistance adapted to the terrain over a depth of from one to two miles with an average of two miles of front controlled by one battalion.

Back of the first echelon, at around four miles from its exterior edge, the supporting battalions of the conventional artillery organized as centers of resistance.

At about four miles back of the first echelon, the second echelon occupied in accordance with the same plan as the first, but with less density.

Back of this, at about six to 10 miles from the front, one atomic battery per length of front corresponding to two divisions (army corps zone). A battalion of 12 pieces corresponds to an army front (estimated at 50 miles).

In the same zone of action, mobile combat reserves: light, medium, and heavy tanks as reinforcements, and special troops such as paratroopers, commandos, and airborne forces to be sent into action by the highest level of command.

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## Atomic Training--Now

Digested by the MILITARY REVIEW from an article by Captain E. McCormick  
in the "Australian Army Journal" January 1956.

WHEN the fog of propaganda lifted and information on the capabilities and effects of atomic weapons became readily available, it was obvious that they were just a normal development in the progress of weapons of war. They posed no problems entirely new in total war, but emphasized old ones already apparent with the increasing use of airpower and airburst shells.

What is needed now is a demonstration of how to tackle training for the immediate future, giving full weight to the atomic factor, pending clarification of the tactical implications and the organizations to meet them.

First, all ranks need a grounding in atomic weapons and their effects. We have available the publication, *Basic Atomic Training*, which provides the un-

adorned facts as a starting point in teaching troops how they can still survive to fight under the conditions imposed by the atomic threat.

This training also will play an important part in removing the fear of atomic weapons by giving soldiers an understanding of them.

Certain aspects of individual training which have been important in the past now assume greater importance in protecting individuals against the effects of atomic explosions, and, at the same time, in preparing them to fight almost as a matter of instinct after an explosion has occurred.

The enemy must first find a target before he can use an atomic missile to destroy it. This places great emphasis on any forms of deception, whether by con-

cealment and camouflage, movement and work at night, dispersion, vehicle and track discipline, or signal security.

These are the subjects in which soldiers must be highly trained to reduce the possibility of an atomic attack. They also must learn to dig in at every reasonable opportunity to place a layer of earth between them and the heat, blast, and radiation of an explosion.

These measures may seem passive, but they are, in fact, an active means of ensuring that soldiers can fight effectively. For the future, infantry soldiers must expect to fight with whatever weapons and equipment are available after an explosion, and to do this they must be trained to use any weapon in the battalion. As many as possible also must be able to operate all radio equipment and drive any battalion vehicle.

To carry this forward to collective training, carefully designed exercises can give all ranks a chance of meeting the difficulties they will face in an atomic battle, and of overcoming them.

The beginning must be simple, since we have neither the atomic background nor the training time to progress beyond the elementary stages at the present time.

Initially, collective protection must be superimposed on all training activities by day and by night. Primarily, this is protection by concealment and other means of deception, digging, and dispersion and can be summarized as:

Concealment and camouflage.

Move and work by night.

Dig in whenever halted.

Maximum dispersion at all times.

Operational necessity may conflict with these requirements on occasions, but they are stated as the ideal to give maximum protection.

Recovery exercises on the platoon and company level can follow, emphasizing that after an atomic explosion the soldier's first task is to fight. The enemy can be expected to follow up quickly the advantage gained by the use of an atomic missile. The actions of individual section, platoon, and company commanders, perhaps cut off by destroyed communications, might well decide the issue.

Simple training aids such as mortar flares and Very lights can provide the "blinding flash of light" on which troops take action as if an atomic explosion had occurred. If troops remain fixed in the positions they were occupying or took up immediately when the blinding flash of light was seen, the unit atomic warfare officer can allocate casualties, then signal the "go ahead" for the rallying and reorganization drill.

Rallying from an atomic attack and reorganization with the survivors could be a fairly simple exercise on the battalion level, providing a team of umpires can be trained by the staff atomic warfare officer.

These are things which can be done now, without waiting for atomic organizations and tactics, and unless they are done we will not be ready for any advanced training introducing the atomic factor.

In summing up it is evident that our starting point must be a grounding in atomic training for all ranks. Following this the subjects in individual training emphasized by the atomic threat must be covered thoroughly.

Even now we can go further in collective training by exercising subunits in collective protection and simple recovery exercises using the training aids we have available.

# The Change in Tactics Through Atomic Weapons

Translated and digested by the MILITARY REVIEW from an article by Doctor (General) Lothar Rendulic in the "Deutsche Soldaten-Zeitung" (Germany) April 1956.

THE strategic employment of heavy atomic weapons (bombs and, in the near future, remote-controlled weapons) has brought a very great simplification to the theory of warfare. According to the prevailing doctrine, the decision will be won in war by means of massed surprise attacks with atom and hydrogen bombs on the command, transportation, and production centers of the enemy. The fact is overlooked, however, that even blows of decisive effect cannot take away from the adversary all possibilities of striking back with the same weapons.

Atomic warfare is the most "compressed" form of warfare. The delivery of a counter-blow, even with a lesser number of weapons—and all weapons cannot be destroyed even with an attack lasting a very considerable length of time—can inflict catastrophic devastation on the attacker also, so it is justified to question whether the decision, in the sense of a victory, can be obtained in this way.

The necessity that ground forces be engaged in a fight for the decision—if only for missions of secondary importance—cannot be dismissed. No matter how simple one may imagine the strategic employment of the atomic weapon will be, the combat operations of the ground forces will be exceedingly complicated by the use of such weapons. The tendency which exists in many circles to reject the possibility of any such combat operations constitutes a dangerous error.

## Type of Weapons

Every mode of combat is decisively influenced by the nature and effects of the weapons engaged. The only tactical atomic shell that has thus far been announced

is the shell of the American 280-mm atomic cannon. It is an unusually unwieldy gun which requires hours of preparation for its employment. The effect of this shell corresponds to 20 kilotons of TNT. Guns of lesser caliber are being provided with atomic shells—for instance, the American 8-inch howitzer. Their effect can be expected to be correspondingly less.

The 20-kiloton shell effects complete destruction of the unprotected persons within a circumference of about one mile from the point of explosion. But, at a distance of only 660 yards from the point of explosion, protection can be found from the heat wave and the primary radioactive radiation by means of thick coverings of earth, so that the possibility of nullifying the effects is ensured for troops and weapons protected in this way. Also, in the case of explosions in the air, all of the dangerous area can be traversed by vehicles and men about 10 minutes after the explosion, although it is better that the troops have light protective garments at their disposal.

Bombs dropped by planes, which have greater effect, will be used but exceptionally in the fighting of the ground forces. These will be considered only for targets far from the front and in those places where zones are to be liquidated completely. Developments tend rather toward the creation of shells with an effect that is considerably less as compared with the bombs, which makes their employment possible in the areas occupied by ground forces without interfering with one's own intentions for any great length of time. The fact also must be considered that atomic weapons will be used relatively sparingly. On one hand their number will be very limited; on the other the atmos-

sphere would become contaminated as a result of the steady use of small shells.

Just as in its time the newly appearing machinegun gradually became the principal weapon of the infantry, the atomic weapons have already become the decisive weapon of aviation, and they are now becoming the principal weapon of the ground forces. Just as the machinegun led to a reshaping of combat methods, a similar influence is now projected by the atomic weapons. However, these are operating in a much more revolutionary manner on ground action than did the machinegun. Notwithstanding this, we shall find on closer examination that the great fundamental principles of combat essentially continue to hold good; only the manner and the method of translating them into deed present great differences as compared with former operational methods.

We desire here to examine in their main aspects only the two principal modes of combat—attack and defense. It should be stated in advance that because of their surface effect the tactical atomic weapons cannot be used against those portions of the enemy forces in close contact with one's own troops, although their use is quite feasible against targets one and one-half to two miles back of the enemy's frontline.

#### Concentration of Forces

Heretofore, attack has necessitated the establishment of a main effort and, to this end, concentration of forces. This requirement will remain in the future even though in changed form. In World War II aviation made the fulfillment of this requirement quite difficult.

Concentrations had to be much looser than in World War I. The movement of the forces intended for the attack into the assembly area had to be effected in the shortest possible time. Even then the employment of motorized forces was found

to be quite advantageous. Today, we cannot consider any concentrations whatever in the former sense. The grouping of the forces intended for the attack can be carried out only in an extensive area. Therefore, when stronger forces are needed in an area in which the decision is sought, they must be brought into the more restricted troop area from their dispersed locations at the last moment, so to speak. This requires great mobility on the part of the formations, good concealment of all movement, and, when the movement is carried out in daylight, protection against attacks by the enemy's conventional aviation.

There is always the possibility that the adversary may detect the movement and recognize its meaning and that he may break it up by the use of tactical atomic ground weapons or at least disorganize or block it. For this reason one cannot "make out" with a single main effort. A number of such points must be chosen. Since this is contrary to previous concepts, the expression "main effort" for the area in which the decision is sought is no longer applicable. In its place we have a *main effort system* where actions are controlled from one place. The main effort in the old sense is changed to an operational concept which provides the framework for still further "main efforts."

With several tactical "main efforts," the forces which are apportioned to the individual points will, of course, be of lesser strength. This will be compensated for by the effect of one's own atomic weapons. This effect is to be directed against the artillery and major reserves. The engagement of the atomic weapons must be accurately timed with the bringing up of the reserves and will be delayed until the movement of the reserves has been completed in large part.

The ground fighting will be concerned first with the adversary's forward forces which will be most difficult for him to

support from the rear. The adversary is thus required to bring together his widely dispersed reserves in order to counter the recognized intention of his opponent, and this again gives the attacker suitable targets for his atomic weapons. We see here that the importance of the initiative which the attacker possesses manifests itself unaltered.

A tactical success that he has won always means a crisis for the attacker, for a massing of forces in the objective area results from it. A further critical condition results from the exploitation of the success, as new reserves have to be brought up. This should not be difficult for the adversary to prevent since it often has to be done through a comparatively narrow zone. For this reason it is questionable whether the success can be exploited in the former manner by immediately calling in reserves. It should be better (if this has not already happened during the fighting) first to seek to effect a rupture by an adjoining point of main effort, and to roll up the combat zone between the two. A relatively broad area for the continuation of the assault will then result which will give the reserves, which are to be brought up, greater freedom of movement and decrease the likelihood of their being successfully combated by atomic weapons.

#### Night Combat

The center of gravity of the attack lies in the reserves who are engaged in several waves. Provisions for the command of widely dispersed formations are especially important. Due to considerations relative to concealment and mobility and to preclude the creation of attractive atomic targets, these formations must be small. In the case of the infantry, they should not exceed the size of a battalion—around 600 men. The formations must be trained to adjust themselves quickly to changes of orders and unpredictable battlefield transportation. In general, they must

"make out" in the face of difficulties which will occur far more frequently than in times past. Nighttime, especially, must be used for tactical movements, and for moving into the attack area. For this reason training for night actions will be very important. The Soviets have attached great importance to this training lately.

Formerly, in order to protect forces from the effects of the enemy's weapons and to achieve greater strength of resistance, defense was strongly organized in depth. Today, this will no longer be possible to the customary degree. The deeper the rear area of a position, the more it will be subject to combat by atomic weapons, and the more uncertain will its worth be in defense. For this reason the center of gravity of the defense is to be in the front zone. Since the effects of the traditional weapons have in part remained the same and in some cases considerably increased, limits are placed on the density of the occupation of this zone. Thus the strength of the defense has been shifted to the mobile reserves which are distributed far in depth. The attacker certainly will attempt to prevent their arrival by means of his aviation and his atomic weapons. The defender will take similar actions with respect to the reserves which the attacker needs for obtaining and exploiting his success.

Considering the secondary effects of the atomic weapons (heat and radioactivity), the first view on their employment was that the effects offered greater advantages to the defender than to the attacker. The defender, as a rule, needs to take less thought of the secondary effects of the weapons he employs.

This view, however, is no longer tenable due to the existence of the tactical atomic weapons with an effect of 20 kilotons and under. These will constitute the actual equipment of the ground combat forces and the secondary effects which interfere with the conduct of ground operations do not ap-

ply to them. They are just as well suited for attack as for defense. It is true that the psychological interference they create is greater for the attacker than for the defender. This is due to the tendency toward panic produced and instilled by the great effect of the atom and hydrogen bombs. This must be thoroughly combated. It is not without reason that the Americans, in their tests, station troop units close to the edge of the danger zone created by the explosion, and permit these troops to move about over it after the proper lapse of time.

Since the main combat zone of the defender cannot possess the strength and organization that was familiar in World War II, its conquest will not require the traditional means of that war. If it is taken by the adversary, however, thoughts of a withdrawal by the defender for any considerable distances cannot be entertained. Rather, he must stay close to his enemy and with the aid of few reserves, establish a new defense zone. At the same time, by the use of his own atomic weapons, he will prevent his adversary from bringing up strong reserves. For the attacker, the moment of his irruption into his adversary's zone is a moment of great weakness. He has placed his cards on the table and is offering the defender great chances for the use of his atomic weapons.

### Digging In

Protection from the heat wave and radioactivity of the adversary's atomic weapon requires the construction of deep, or covered trenches. Digging in has become enormously more important than in former times, and also applies to tanks, guns, and vehicles. It is imperative that this be done wherever there is an opportunity, even where no combat fronts exist.

When we stop to consider that units often change their areas, we realize that the forces will be busy a large part of their time in excavating operations. This leads

to the requirement for excavating equipment. In any case, every man must be equipped with an efficient tool for this purpose. This fact also has as its further consequence, that wherever atomic effects are to be counted on—and this will be the case everywhere—marshy and rocky terrain will be avoided for fighting.

### Target Reconnaissance

Of importance in the employment of atomic weapons, both to the defender and the attacker, is the reconnaissance of the targets. The more the formations are dispersed, the less suitable will be the targets they present. In this connection, it must be borne in mind that dispersal is limited less by considerations relative to command than by limited extension of the available terrain. In view of the fairly long length of time still required for the preparation for firing the atomic weapon, a unit which rightly assumes that its position has been located by the enemy will be able to escape the atomic action by a change of location. Any lengthy halt in an area back of the front is always to be avoided.

Even though covered terrain behind the front formerly meant an advantage to attacker and defender alike, today, it is very much more to the defender's advantage. Although formerly the importance of covered terrain decreased with its distance back of the front, its importance continues into an area that is practically limitless in depth at the present. This is the area in which the movements of the reserves occur.

One final consequence of the necessary smallness of the units and the greater number of them will be that the coordination of atomic fires with the concentrated effort by the artillery and heavy weapons will be rendered very difficult. In any case, the most favorable conditions can be created for overcoming this difficulty by means of training and equipment.

## Atomic Weapons and Armor

Digested by the MILITARY REVIEW from an article by General Geyr von Schweppenburg in the "Australian Army Journal" May 1956.

*In World War II General von Schweppenburg commanded armored formations on the Eastern and Western Fronts, where he established a high reputation as a leader of this arm. Since the war he has written and lectured widely on military subjects.—Editor, Australian Army Journal.*

VIEWS about the nature of ground fighting in the atomic age differ widely among international experts. The situation was aptly summarized by General Ridgway, former United States Chief of Staff, when he spoke to American officers of various arms of "the unpredictable nature" of the future conduct of war.

As a background to a discussion of the future possibilities of the role and organization of armor, it is desirable to make a few introductory observations. This is especially necessary because there is a considerable number of people who think that armor has passed its peak.

It has been known for a long time that tanks and aircraft can be the best of companions or the worst of enemies. Operations involving the large-scale use of armor, by night as well as by day, basically demand the fire support of the tactical air arm.

Toward the end of World War II the rocket firing airplane of the Allies had become the major enemy of the German tanks because of its accurate and deadly fire. The air supremacy of the Allies made the old tactics involving large concentrations of tanks impossible. The difference in the situation in the air had the effect that, upon my recommendation, different techniques for the east and west were

taught in German armored schools from the middle of 1944 onward.

### Old Tactics

Due to the possibility of atomic warfare, the old German armored tactics, as applied during the period of their greatest success, are outmoded and untenable. These tactics were analogous to those commonly employed by Napoleon. They sought to concentrate their firepower and their tanks quicker than it was possible to organize an effective defense and at a point selected at the last possible moment. The breakthrough followed naturally.

These tactics are untenable in their present form. However, the synchronization of a surprise atomic attack from the air with the atomic artillery and rocket launchers of an armored group, makes it possible to achieve at the selected point of breakthrough a similar effect with a smaller concentration of actual numbers.

We come now to the problem of the maximum use of the shortest space of time. This was always necessary. Thorough success or failure has ever been associated with the utilization of the first one or two hours after the actual breakthrough.

The question now arises: Can the pairing of the high mobility of armor with the atomic weapon, even under the changed conditions of the atomic battlefield, be regarded as useful? The answer is that it can.

### Defense

Armor is an attack weapon second to none. Clausewitz, the great theoretician of war, said in his day that defense was the strongest form of warfare. Even in the early 1860's the elder Moltke had seri-

ous doubts as to whether, with the then current development of firepower, the defense was not stronger than the attack. However, once he had overcome his doubts, he gained his victories through the attack.

World Wars I and II further proved that the Clausewitz theory did not hold true in practice. It is the spirit of theorizing in the study or in the offices of higher headquarters, and not that of commanding on the battlefield, which leads to the timid theory of the defensive.

A certain amount of protection against atomic weapons can be gained by two means—high mobility, as with armor, or by digging in. In an atomic war both will be necessary. But a purely passive defense can at the best gain only time and will probably meet encounters of only local or passing value.

Passive defense is unsuitable against an enemy attacking on a wide front. Prepared positions will quite probably be known to the enemy and can be eliminated easily by an atomic attack or bypassed. Such an attitude would give the enemy the all-important initiative, and absolute freedom of action.

Nowhere has it been demonstrated that armored tactics are outmoded when developed for atomic warfare. It would not be the first time that the leaders of armor have had to adapt themselves to combatting superior firepower.

#### New Tactics

At the beginning of the Allied invasion of western Europe responsible German armor tacticians suggested that "tiger in the jungle" tactics should be employed. The theory consisted of small, widely dispersed but quickly concentrated groups of tanks lying in ambush, and crossing no man's land at night to enter the enemy's frontline.

These tactics were designed to counter the Allied air superiority and its far-reaching effects on the battlefield. With a

breakthrough of the enemy's frontline, the Allied air support would have to be withdrawn or at least curtailed. Likewise, the atomic defense of the enemy would have to be lifted if confronted with similar tactics. It would be most difficult not to do so, and only extreme ruthlessness would consider putting one's own lines under atomic fire.

Actually, the ideas of the German armor tacticians were not accepted at Hitler's headquarters, even though they had the support of Guderian, and were not put into practice.

In atomic warfare the emphasis has to be placed upon avoiding large concentrations of troops, or, if this is unavoidable, on limiting them severely in time.

#### Tank Battle Groups

The mobile battle groups which have to be kept small must be spread out on the plains in width as well as in depth in a checkerboard fashion. The discovery of movement—detectable by airborne radar at night as well as by day—with the subsequent atomic attack can mean extinction.

The answer to this is the saving of time through the highest speed in the transmission of orders by cutting down the length of the chain of command. The decisions which have to be made by the command have some of the characteristics of the duel—there is always an element of risk.

Today, everything points toward a decrease in the size of the battle groups, and an increase in their capability for independent operations. In order to secure this independence they must have everything they require under their own command. They should have their own reconnaissance airplanes, their own helicopters to carry advanced troops, their own cross-country supply facilities, as well as their own air supply and transport aircraft.

The tactical independence of the junior

leader will become a prerequisite for success.

With all that we will need the ability to change rapidly from attack to defense. This rapid change can be achieved only through the closely integrated use of armor and airpower. The necessary degree of integration cannot be achieved unless the ground forces possess their own tactical air arm.

These new armored groups will have to contain all their associated and supporting arms, including their tactical aircraft and will have to be welded into a fighting unit in peace.

These new armored troops will have to take into consideration the fact that because of radioactive contamination and the risk of betrayal of their position, the normal routes along roads will be closed to them. In addition, their only protection against atomic attack can be gained through mobility. Therefore, it is of the greatest importance that *all* vehicles should be capable of cross-country movement.

These considerations limit the size of such a striking force to a strong armored regiment with the nucleus consisting of a strong battalion of mounted infantry divided into five groups. Such a force, even with the attached troops, could still be led at night. Since the loss of complete companies has to be foreseen, their quick replacement from reserves held in depth should be planned. Up to seven such groups would come under a corps staff. To

shorten the chain of command the divisional echelon is eliminated.

Supply of such troops would be the most difficult part of an atomic war. At present it seems that this can be solved only through one of two measures—the first is supply by helicopters operating at night; the second is that each troop should carry an iron ration of food, ammunition, and spares. The supply of fuel from the air will have to be done mainly under cover of darkness. The high risk of this method of air supply will have to be accepted.

#### Calculated Risk

In war many things are risky. The calculated risk is the seed of success. The question of whether the attack is still possible in the battlefield presence of atomic weapons and radar surveillance cannot be answered fully in peace. Only in combat will it become known whether the means used are sufficient to gain and hold the initiative.

At the beginning of World War II German armor was regarded by many responsible German military leaders as a novel toy which would have to be replaced by infantry as soon as the going became tough. The first big battle of destruction, the Battle of the Polish Corridor, brought the proof of this error, through the success of the Berlin Panzer Division and the first big night battle of tanks versus infantry on 2 September 1939. The unbreakable spirit of the attack will always win over the doubting indecision of defense.

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We must stay alert to the fact that undue reliance on one weapon or preparation for only one kind of warfare simply invites an enemy to resort to another. We must, therefore, keep in our Armed Forces balance and flexibility adequate to our needs.

President Dwight D. Eisenhower

## Speed and Surprise in an Atomic War

Digested by the MILITARY REVIEW from an article by Major M. L. Crosthwait  
in "The Royal Engineers Journal" (Great Britain) June 1954.

THE trend since the end of the last war has been to avoid specialized engineer units. It has been rightly said that the number of engineers will be so limited that we cannot afford to tie up units in specialist roles. Despite these facts—and they apply to both combat and line of communications units—with the advent of atomic warfare at least one (and perhaps other) specialist engineer unit may be required.

### Atomic Warfare

It is unwise to hope that atomic weapons will not be used in a future war. The basis of all United States defense plans, according to published reports, is that they will be used. Field Marshal Montgomery has given his personal opinion that in the event of war both sides will use their atomic capability. Every major army in the world is, therefore, reexamining its organization and doctrine to see what changes an atomic age makes necessary.

The engineer corps also must be examined to determine if any major changes are indicated to meet the demands of atomic warfare. Before this is done, however, it is necessary to consider what these increased demands on engineer functions are likely to be.

Although little is actually known of the battlefield effects of atomic weapons, one basic lesson can certainly be anticipated. Every effort must be made to avoid presenting the enemy with a target he could consider worthwhile bombing. Any effort or time expended for this purpose will be amply repaid.

Principally, this is accomplished by surprise and speed which bear a very close relationship. Surprise as well as speed

can be accomplished by improved troop movement facilities; engineer road maintenance and construction thus contributes to both these vital features. Engineer functions of camouflage, concealment, and river crossing provide surprise—and engineer-built fortifications and emplacements may well contribute to surprise by reducing the effects of the enemy atomic effort to less than he could otherwise expect.

From the engineer viewpoint the atomic effects of blast, heat, and radiation essentially mean an added workload. Unless these effects are properly counteracted, they may considerably reduce the two battlefield aspects in which the engineer is vitally interested and which the atomic battlefield commander is surely to demand: facilities to permit him to move to, into, and out of assembly areas with greater speed; and action to assure that the essential element of surprise is in our favor.

### Engineer Tasks

The time-honored role of the engineers is to enable the army to live, to move, and to fight.

Dispersion, camouflage, protective construction, and quick repair to damaged facilities are all necessary if an army is to maintain itself logically in a theater of war. The extra load thrown on the engineers will primarily mean extra units—or austerity scales if engineer units cannot be increased. Qualitative changes in organization seem unlikely to be required.

The opening and repair of communications in atomic war probably will be reflected in numbers rather than in specialists. Training, mechanization, and the

maximum exploitation of indigenous labor will all play an important part.

The constant aim of the commander in the combat zone must be to disperse his formations and units so that a good atomic target is not offered. In defense this will be easier than in the attack. In the attack the ability to avoid becoming a target will depend on speed—quick concentration, quick movement to the objective, and quick dispersion. The enemy must find it difficult to discover where concentrations are taking place, and the target must already have dispersed before he can react.

It is the ability of the combat engineers to enable a commander to make use of speed and surprise in the attack that requires special examination.

#### Speed

Recognizing the pressing need for greater tactical speed, will the division engineer be able to assist the commander in reducing the time it takes to put his division across a major water obstacle? Whether he is thinking of his own regiment or of the backup which will be forthcoming from corps troops, the division engineer may find it difficult to solve this problem. It must be remembered that the divisional commander will be primarily interested in immediately organizing an antitank defense on the far side of the obstacle. That probably means heavy tanks, heavy rafting, and bridging.

The division engineer will consider the standard of training he knows to exist in both divisional and corps engineers. But even a good average training standard may not necessarily mean a particularly high standard in rafting or bridging.

In war, especially, too much can depend on the type of work that units have been doing up to that period of the battle. The advances in equipment design will not in themselves guarantee quicker work in darkness and in difficult terrain.

The division engineer will think of the relatively few items of river-crossing equipment available in combat engineer units, and the resultant lack of experience in using it. He will assess the possibility of obtaining more equipment (making mental reservations about the provision of equipment operators and their "bridging" training). Finally, if there have been casualties recently, he can hope that the experience in units as a whole will compensate for any lack of skill in newly arrived officers and men.

If the major crossing involves minor approach crossings, assault engineers can help with their more varied techniques. To enable the division to cross where the approaches are bad—to obtain surprise—will probably require the loan of equipment, material, and labor from corps.

But in the end the division engineer might well have to admit that he could not promise any startling improvement in speed or performance. If conventional weapons only are involved, he could very reasonably assure his commander that with the immensely improved equipment likely to be available there need be little worry on the score of timing. But atomic weapons call for a fresh assessment as to what is a satisfactory time and what is not. The divisional commander will undoubtedly demand greater speed in the river crossing.

The problem can be crystallized as follows: If it is acknowledged that speed and surprise in attack will be of the utmost importance in the face of an atomic threat—so important that they may spell success or disaster to an operation—everything possible must be done to enable the engineers to play their part in achieving these two goals.

#### Specialization

Given two units, one trained and equipped for the task in question, and the other a unit which is given general all-around training and which contains

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only a proportion of the equipment required for the task and must borrow equipment to accomplish its task, which is likely to produce the quickest and most efficient work?

In the future, as in the past, there will never be enough equipment, cranes, dozers, and forklifts to equip all field units with what they will want for a major obstacle crossing operation—and certainly insufficient to provide for reserves in case of casualties. Although pools of equipment may be available, there will seldom, if ever, be an opportunity to train the engineer team (including the reserves) so as to exploit fully the potential of such a team. This potential can only be fully exploited if, in fact, the team is permanently together and is fully practiced and equipped for the task in question.

This fact has always been known, but it has neither been a military necessity nor an economical proposition to make use of it in the past. Military necessity, as reflected in the demands of field commanders for speed and yet more speed, may force a degree of specialization on us in a future war.

Specialization will be a small price to pay to lessen the chance of annihilation.

#### Unit Required

The characteristics of the unit required would include the ability to carry out all types of bridging and rafting and a great capability in route-opening road construction. It should contain equipment of each and every description required for the performance of its roles, and this equipment would be held on a luxurious scale.

It must contain the proper balance of field engineer labor so that it could operate without outside help under average conditions. If extra manual help were required, it would have to be obtained from the unit being supported. It would have a considerable all-around engineer capability as byproducts of its main roles—especially in protective construction and in assistance in organizing a defensive position.

Primarily the unit would be included under army troops. It would be handled similarly to assault regiments with whom it might well be grouped, the two together forming parts of a larger and more comprehensive team. It should be so adept at night and all-weather operation that every opportunity afforded by organization, training, and mechanical handling is exploited to obtain speed and reliability in performing its two primary roles.

#### Conclusion

Additional engineer effort will certainly be a major factor in providing the combat commander with the speed of movement atomic warfare will require, and in assuring that the element of surprise favors us more than it does the enemy.

Although the increased engineer output required by atomic war will have a quantitative rather than qualitative effect on the corps organization, there is a strong case for the specialized engineer unit in the presence of the tactical atomic weapon. Without such special units the necessary speed and surprise, especially in attack across a major obstacle, may not be achieved.

## MOVING?

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# Atomic Weapons and the Principles of War

Digested by the MILITARY REVIEW from an article by Major D. F. Wharry  
in "The Journal of the Royal Artillery" (Great Britain) January 1956.

THERE can be little doubt that the arrival of atomic weapons on the military scene will require some reevaluation of the principles of war as we know them.

In the following paragraphs each of the 10 British principles of war is considered from the aspect of atomic warfare in an effort to determine the extent to which the presence of the nuclear mass destruction weapon on the battlefield will affect these principles.

## Morale

It is beyond question that nuclear warfare will produce new degrees of strain which will be more severe than any encountered during a previous war. Therefore, we in the service must be ready to accept these strains by training ourselves and our men to face them and to remain efficient fighters under them. We can do this only if we have a thorough knowledge of the effects of atomic attack, and know intimately the various methods by which we can protect ourselves against it. It must be driven home to every soldier that a nuclear explosion is short and sharp—*very sharp*. It is wrong to underrate it now and give people false hopes. The results in war of such a policy would be devastating. The soldier must learn that if he is all right within a matter of seconds after the explosion, he is capable of fighting back. He does not have to cower in his foxhole waiting for the effects of radiation to wear off.

The business of being ready to fight back is of paramount importance—it is mandatory—and the responsibility for rallying their men immediately after an explosion will rest, as it always has, with the junior officer and senior noncommis-

sioned officer. They will be entirely responsible for restoring quickly the confidence which will have been shaken by the intensity of the explosion. This responsibility can never be relaxed; it is doubtful if anyone will ever become "inoculated" against atomic attack as they did against orthodox weapon attacks in World Wars I and II.

## Concentration

The existence of nuclear energy weapons reinforces the principle of concentration and their use puts it into practice. A more concentrated effort would be hard to imagine. We cannot, however, just sit back and say that by using an atom bomb we have applied this principle and must surely win the battle. Men and materials must be ready to concentrate and follow up the advantage offered them by successful nuclear attack. Here, we must consider the significance of the wording of the last sentence: "ready to concentrate." Concentration, under the conditions imposed by modern warfare, is in terms of time. In no circumstances must we expose ourselves unnecessarily to nuclear attack by physical concentration in space. We must be highly mobile and work on a most detailed time program.

## Surprise

In order to obtain anything like the instantaneous support offered by one 20-kiloton nuclear energy missile, we would ordinarily have to concentrate a myriad of conventional guns—sacrificing any thought of surprise. Atom bombs and shells enable us to overcome this and from one weapon we can now deliver devastating firepower. The possibilities of sur-

prise are immense and we must always be ready to take advantage of them. The converse of this applies equally; we must guard against such surprises. We can guard against surprise attack by never inviting it: by not presenting ourselves as targets worth a missile. Remembering that atom bombs do not grow on trees, it follows that targets will have to be selected carefully.

We must pay more than lip-service to concealment and camouflage for they are our greatest protectors in the field. Bad habits picked up in war die hard. There is no doubt that we were careless in our camouflage and concealment habits in the last two years of the war. We cannot afford to learn the hard way in a future war. We will be fighting for survival, and survival from an atomic attack will not come easily.

#### Offensive

Although we may look on the nuclear energy bomb as our answer to the enemy masses in the field, nevertheless, it must not be regarded as a purely defensive weapon. Nuclear attack could be the means of turning imminent defeat into possible victory. Although the weapon is not absolute, used properly with full exploiting forces available it would be possible to turn the scales of battle as never before. We must always be ready to take the offensive no matter how black the situation may look. Not only must we consider gaining the ascendancy from direct atomic attack to our immediate front, but atomic interdiction in the rear areas of the battlefield often could lead us to taking offensive action with orthodox weapons.

#### Security

Although security is essential to enable a commander to enjoy freedom of action in the forward areas, it does not mean vast concentrations of men guarding areas of depots and workshops. Se-

curity always suffers by dispersion and economy of manpower; this will continue to be the case since dispersion is inevitable. Base area installations will have to be more self-reliant in defense against infiltration, fifth column attack, and airborne invasion. We must accept certain loss of administrative efficiency in times of local threat as the supply of manpower will be strictly limited. We also must be secure against atomic attack by using concealment, camouflage, secrecy, and good intelligence to the utmost degree. The battlefield, including rear areas likely to harbor enemy guided missile launchers, must be kept under strictest surveillance by day and night.

#### The Aim

Atomic weapons, not being absolute, are a means to an end and not an end in themselves. They are, therefore, one of the means by which the aim is secured and should play no part in influencing its selection.

Whereas mobility in the offense is usually toward the objective, in defense it is likely to take the commander's eye off the ball. Never before was a commander more apt to be diverted from his aim of defending a certain area than by enemy atomic attack and the disruption of a normal battlefield that it is likely to cause. Such an enemy stroke may alter the battle picture to an extent resulting in a commander readily changing his plan, without giving due consideration to the long-term consequences. He must ensure that his battle object can be maintained in spite of atomic attack and that the defended area can survive it.

#### Mobility and Flexibility

Mobility and flexibility are of the utmost importance in any future war. Mobility as we knew it in World War II would not meet the conditions of the next. Then, we were usually already physically

concentrated before attack, forming up in chosen spots, avoiding presenting targets where possible, but accepting certain loss of surprise and casualties where necessary. We would then move to our start line, in the correct order of battle, not quite like the Roman Legions in their phalanx, but in comparison with the future, not so very different from them. There, we would conveniently wait for H-hour, and advance.

These somewhat laborious and complicated procedures are no longer possible. In order to ensure that all arms meet up for the successful exploitation of an atomic explosion, and that orders may be altered during this meeting up process, plans must be kept simple.

In order to avoid offering targets for atomic attack, our mobility at night must be as great as by day. We may fight by day, but it is unlikely that we will carry out any other business during light hours. All administration, no matter how important, will be kept for the night. We must learn to live by night and sleep by day for weeks on end; always ready to change our habits and become fighters by day and toilers by night, sleeping when we can.

#### Cooperation

In atomic warfare cooperation remains of paramount importance. With the ever-increasing requirements for coordination of movement and widely dispersed maneuvers, not only will arms and services be required to maintain the closest liaison, but also individuals, both in headquarters and in subunits forming homogeneous combat groups. Cooperation between ground and air forces must be of an even higher order than in the past; with the possibility of close support aircraft carrying tactical atom bombs, there can be no risk of mistaken bomb lines. Recognition of friend and foe must play a most significant part in the future.

The battle of the future is likely to de-

velop into many minor engagements necessitating subordinate commanders being given far more latitude than before. The degree of cooperation is, therefore, decided by the necessity for local adjustments of details to be made mutually by junior commanders, without reference to higher authority.

#### Economy

This, as always, plays its part in modern warfare. Why kill a fly with a sledge hammer, when a fly swatter will do? We must continue to look on orthodox weapons as our day-to-day fighting materials. We rely on the atom bomb to give us our surprise and concentrated firepower where and when they are most needed.

Often we can carry out successful offensive operations with minimum forces supported by atomic weapons, where normally we would use large forces and orthodox weapons. It quite often will be a case of balancing the use of manpower against kinetic energy; this, perhaps, more so in defense than in attack.

#### Administration

The need for concealment and camouflage has been sufficiently brought out. If this presents a problem from the air to men, tanks, vehicles, and guns—mere ants on the ground—then what sort of problem is presented to the logistic organization that exists behind the forward troops?

The time has come for a complete review of our administrative system. We must disperse our ports and make full use of temporary harbors and beaches. We must increase flexibility by ruthlessly discarding outmoded means of transportation. We cannot arm ourselves with the best of all weapons only to defeat ourselves by sticking to diehard administrative methods. Within the financial strin-gency imposed, we must study the use of cross-country load carriers and air trans-

port; we must look to helicopters and vertical lift aircraft. This, however, is an expensive way of overcoming the problem and economy must be practiced by all commanders in the field.

### Conclusion

I feel we can safely conclude that, however new and revolutionary the nuclear and thermonuclear energy weapons may be, their success depends entirely on the members of the three fighting services and the use they make of them. To quote Field Marshal Montgomery:

*... the skillful employment and accurate application of superior nuclear firepower in combination with the operations of streamlined land forces can be a decisive factor in the land-air battle. The problem will be how to force the enemy*

*to concentrate his armed forces sufficiently to offer a worthwhile nuclear target without exposing our own forces to destruction by the enemy's nuclear attack.*

The principles of war upon which our doctrines have been based, although obviously requiring new interpretation, still stand.

We will see many changes in equipment, in organization, and in methods. Our doctrines must be overhauled and, above all, our training must be realistic, with the "atom" hovering over our everyday life. If an action would not be wise in the teeth of possible atom weapon attack, then it must not be taught in training. Our soldiers must be trained and live in the atmosphere of nuclear warfare. We can no longer quote the drills and tactical moves of the last war.

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Your Army exists for one ultimate purpose—success in battle, victory in war. The Army is organized, trained, and equipped for prompt and sustained combat operations on land. The two major missions of these operations are to defeat enemy land forces; and to seize, occupy, and defend land areas.

... the Army's role in the modern military picture has grown rather than diminished in importance. This increase in stature becomes more notable when you consider—as thoughtful people everywhere are considering—the increasing capabilities of the Communists in the field of nuclear warfare. And these capabilities, discounted a short while ago, must be continually recognized.

We no longer control a monopoly on the atom. Since this is a fact, we must prepare for the possibility that a general war or a peripheral skirmish would be decided on the basis of weapons and tactics as applied to ground combat. Under these conditions, the advantage, like the God of Voltaire's time, would be with the heaviest battalion. If this should come about, the importance of a hard-hitting, mobile, well-trained and equipped ground force cannot be overestimated. With its role assured, its spirits high, its organization well conceived, and with adequate force in being, both active and reserve, your Army needs only the support of the people to sustain it in what may well be the long and involved war of the future.

*Under Secretary of the Army Charles C. Finucane*

# BOOKS OF INTEREST TO THE MILITARY READER

**ROOSEVELT: The Lion and the Fox.** By James MacGregor Burns. 553 Pages. Harcourt, Brace & Co., New York. \$5.75.

BY MAJ HARRY H. JACKSON, *Inf*

Using the Machiavellian simile of the lion and the fox, Professor Burns has written an outstanding political biography of one of the most powerful men of the 20th century—Franklin D. Roosevelt. Political scientist Burns examines President Roosevelt's personal as well as public life in an effort to analyze the patterns and influences that molded the personality of his subject. His account is basically a study of political leadership and he is demonstrating effectively the importance of the context or environment in which the political leader of a democratic society plays his roles. Using the president as a case in point, the author demonstrates in a most effective fashion the interaction between the emerging leader and the many facets of his environment.

This work is neither an effort to justify Roosevelt as a Messiah, nor is it a polemic delivered against a villain who feasted on grilled millionaires for breakfast; it is a study of political leadership on the American scene. Viewed in this vein it is worthwhile military reading for those interested in the political structure in which the Army operates and the dynamic pressures under which politico-military decisions are made.

**MODERN PUBLIC OPINION.** By William Albig. 518 Pages. McGraw-Hill Book Co., Inc., New York. \$6.50.

BY LT COL IRVING HEYMONT, *Inf*

This book discusses the psychological processes involved in public opinion. The measurement, recording, polling of public opinion, censorship, and mechanisms of special pleading and propaganda are covered in detail. This definitive treatment of the subject scrutinizes each of the mass media: press, motion pictures, radio, and television. The detailed analysis of the now widespread polling and measurement of alleged public opinion reveals some of the various processes of American culture and the opinion formation process.

Of particular interest to the military reader is the study of the relation of wartime propaganda to morale. It is the author's opinion that changes in opinion caused by propaganda are insignificant compared to changes caused by events and action in the field. While no nation can neglect propaganda, it is essential that perspective not be lost. Psychological warfare can at best achieve only marginal successes and capitalize on the victories achieved in the military, political, and economic fields.

Well-written and thorough in coverage, this book is of value to the reader concerned with the influencing of people as a large group.

**SOVIET IMPERIALISM.** By G. A. Tokaev. 77 Pages. The Philosophical Library, Inc., New York. \$2.75.

BY MAJ ARTHUR B. WHITE, *Arty*

This is an essay compiled from a number of lectures and papers by Colonel Tokaev, engineer, theoretical scientist, aerodynamics expert, and former Soviet jet and rocket expert.

In general, Colonel Tokaev covers such vital and timely topics as Soviet strategy, background to the Soviet Army, Navy, and Air Force, guided missiles and atomic weapons, war supplies and munition industries, staff and military education, welfare and morale of the Soviet forces, and, finally, a balancing of assets and liabilities to determine Soviet power.

It is highly recommended for the reader who desires an understanding of the fundamental trends of Soviet strategy and tactics, without going too deeply into the doctrines on which these are based.

**THE UNITED STATES AIR FORCE DICTIONARY.** Edited by Woodford Agee Heflin. 578 Pages. Superintendent of Documents, United States Government Printing Office, Washington, D. C. \$5.00.

BY LT COL ROBERT M. WALKER, *Arty*

This latest official dictionary of Air Force terminology and definitions, objectively designed and cross-referenced, will find an honored place in the library of any person interested in air matters. It includes the conventional terms and latest connotations of air terminology, and demonstrates the special uses to which many words are put, with emphasis on operational idiom. It is quite specialized, in the sense that only those definitions are given which have a primarily air force usage. The broadness of its coverage makes it an interesting reference for the airminded; the accuracy and completeness of its technical information make it a vital necessity for those who actually work in air subjects.

**THE BALKANS IN OUR TIME.** By Robert Lee Wolff. 618 Pages. Harvard University Press, Cambridge, Mass. \$8.00.

BY LT COL SAMUEL G. KAIL, *Inf*

This is a complete and scholarly book on Yugoslavia, Romania, Bulgaria, and Albania. Everything about these four countries—the geography, the people and their origins, the social structure and politics, and their economies—is examined in great detail.

This book is not recommended for the casual or general reader; it is too detailed for the person interested only in a superficial knowledge of the area. However, students of international relations or politics, interested in the complexities of political and economic life in these Balkan countries, should find it intensely interesting.

The most interesting part of the book is the thorough presentation of all aspects of the dispute which led to the excommunication of Yugoslavia from the Soviet orbit. The absolute ruthlessness of Soviet methods to discredit Tito and his followers and Tito's determined and successful resistance to such methods are brought out vividly.

Mr. Wolff ends his book with a short chapter, written after the book itself was finished, on the immediate past and the foreseeable future of the Balkans. In this epilogue he discusses briefly some aspects of the new era in Soviet-Yugoslav relations, and the possible effects it might have on the other three Balkan countries and the Western Nations. His observations are plausible, and his guesses interesting, but offer little hope that these countries can ever be free of tyranny of one type or another.

**DECISIVE BATTLES OF THE CIVIL WAR.** By Lieutenant Colonel Joseph B. Mitchell. 226 Pages. G. P. Putnam's Sons, New York. \$4.00.

**THE RUSSIAN STRUGGLE FOR POWER: 1914-1917.** By C. Jay Smith, Jr. 553 Pages. The Philosophical Library, Inc., New York. \$4.75.

BY LT COL HOWARD L. FELCHLIN, *Inf*

There are many individuals who believe that the key to an understanding of Soviet imperialism lies in a comprehension of the historical aspirations of the Russian state prior to 1917. As a firm adherent to this school of thought, Professor Smith attempts to substantiate this point of view in his book, primarily by utilizing czarist diplomatic documents subsequently published by the Soviet Government. His fundamental belief is that the Russian Revolution of 1917 did not succeed in creating a permanent chasm between the old Russia of the czars and the new one of Lenin and Stalin.

It is regrettable that the author has not attempted to analyze the pertinent archives of the Imperial Ministry of Foreign Affairs covering 1914-17 in relationship to currently available diplomatic documents of Allied nations during the same period. Meager though the latter may be, they would have been of assistance in giving Professor Smith's book a more balanced orientation. There is quite possibly more than a passing resemblance between the foreign policies of Czar Nicholas II and Stalin, but Professor Smith fails to document the similarity since he neglects to include in his book any factual or authoritative evidence on the machinations of Soviet foreign policy since 1941.

As Professor Smith admits, a completely definitive study of Allied wartime diplomacy during 1914-17 cannot be written due primarily to the lack of adequate documentary evidence of the activities and policies of all participants. His research efforts undoubtedly have shed much light on the subject from the czarist viewpoint and as such should be considered

a worthwhile contribution to the knowledge of Russian foreign policy during this critical period in history.

**THE FATAL DECISIONS.** Edited by Seymour Freidin and William Richardson. 302 Pages. William Sloane Associates, New York. \$4.00.

BY LT COL DANIEL A. RAYMOND, *CE*

This book is an after-action analysis of the six decisive German failures of World War II—the Battles of Britain, Moscow, El Alamein, Stalingrad, France 1944, and the Ardennes—by principal participants therein: Kreipe, Blumentritt, Bayerlein, Zeitzler, Zimmerman, and Manteuffel.

Herein are presented their concepts of the reasons behind these defeats—the mistaken judgments and errors in strategy, with the estimates that lead to them. It is the story of tenacious adherence to lost causes, and the continual interference of the high command in the decisions of battlefield commanders.

There is no question but what this book is a valuable contribution to military history. Its accounts are interesting and absorbing, and uncover an additional facet of the complex behind-the-scenes story of World War II. No student of military history should miss reading it and its keen insights into "lessons learned."

One word of caution goes with its reading. It contains a not too subtle attempt to absolve the German Army of responsibility for defeat that is reminiscent of post-World War I attempts to do the same. The mistakes presented are mostly those of others than the field armies—of the high command, the logicians, the navy, the air force, and, above all, of Hitler and his close advisors. The fighting ability of the German field armies, their commanders, and soldiers comes through without tarnish. Very little credit is given to the ground soldiers of the Allies for any contribution they made to the fateful defeats.

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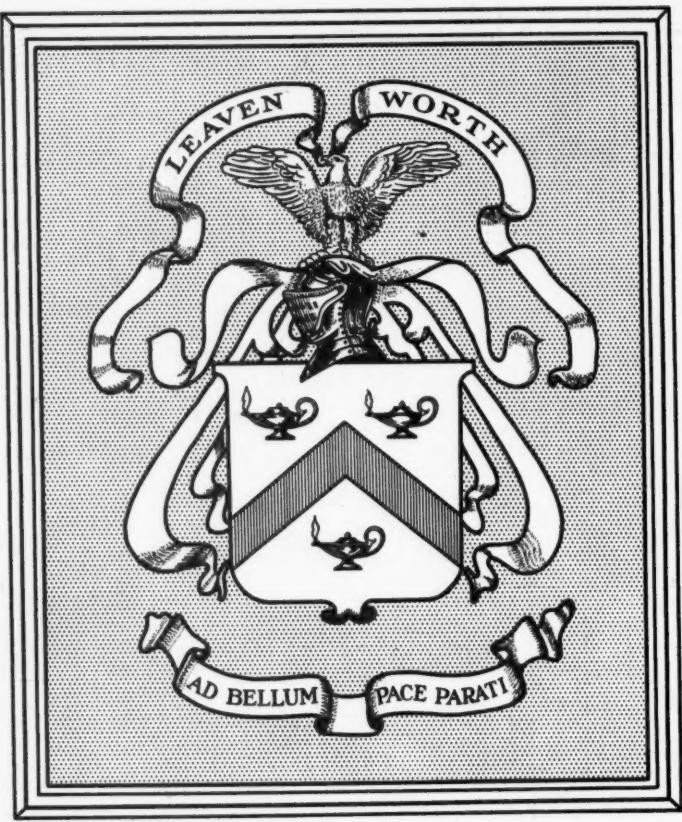
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